Annual Report of the Ministry of Forests and Lands

for the fiscal year ended March 31, 1988

Province of British Columbia
Ministry of Forests and Lands
Honourable Dave Parker, Minister

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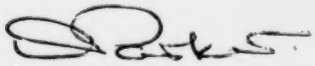
September 30, 1988

Lieutenant-Governor of British Columbia in Council
Parliament Buildings
Victoria, British Columbia

May It Please Your Honour:

Herewith I respectfully submit the Annual Report of the former Ministry of Forests and Lands for the fiscal year ended March 31, 1988.



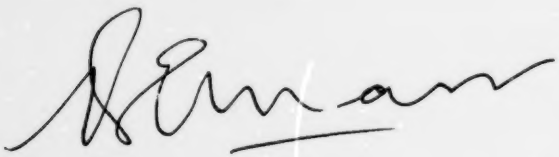
Dave Parker
Minister of Forests
(formerly Minister of Forests and Lands)

September 29, 1988

The Honourable Dave Parker
Minister of Forests
(formerly Minister of Forests and Lands)
Parliament Buildings
Victoria, British Columbia

Sir:

I have the honour to submit the Annual Report of the former Ministry of Forests and Lands for the fiscal year ended March 31, 1988.



B. E. Marr
Deputy Minister
Ministry of Forests
(formerly Ministry of Forests and Lands)

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I. The Ministry of Forests and Lands

Mission

To manage and protect the province's forest, range, forest recreation and public-land resources for the maximum benefit of all British Columbians.

Legislative authority

The ministry's mandate is specified in:

- the *Ministry of Forests Act* [Section 4], which states:
  "a. encourage maximum productivity of the forest and range resources in the Province;
  b. manage, protect and conserve the forest and range resources of the Crown, having regard to the immediate and long-term economic and social benefits they may confer on the Province;
  c. plan the use of the forest and range resources of the Crown, so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are co-ordinated and integrated, in consultation and co-operation with other ministries and agencies of the Crown and with the private sector;
  d. encourage a vigorous, efficient and world competitive timber processing industry in the Province; and
  e. assert the financial interest of the Crown in its forest and range resources in a systematic and equitable manner."
- the *Ministry of Lands, Parks and Housing Act* [Section 5 (a) and (d)], which states:
  "(a) to administer the Crown land resource of the Province;" and,
  "(d) to administer and enforce safety standards prescribed under section 11 respecting recreational activities and services on Crown land."

The ministry's responsibilities and authorities are defined in these statutes:

- *Ministry of Forests Act*, Revised Statutes, 1979, Chapter 272;
- *Ministry of Lands, Parks and Housing Act*, Revised Statutes, 1979, Chapter 277;
- *Forest Act*, Revised Statutes, 1979, Chapter 140;
- *Land Act*, Revised Statutes, 1979, Chapter 214;
- *Range Act*, Revised Statutes, 1979, Chapter 355;
- *Boom Chain Brand Act*, Revised Statutes, 1979, Chapter 33;
- *Greenbelt Act*, Revised Statutes, 1979, Chapter 157;
- *Land (Veterans) Act*, Revised Statutes, 1979, Chapter 222;
- *Land Surveys Act*, Revised Statutes, 1979, Chapter 216;
- *Forest Stand Management Fund Act*, 1986, Chapter 8;
- *Soldiers' Land Act*, Revised Statutes, 1960, Chapter 366; and,
- *University Endowment Land Act*, Revised Statutes, 1979, Chapter 420.

The ministry has administrative responsibility for:

- *Foresters Act*, Revised Statutes, 1979, Chapter 141; and,
- *Land Surveyors Act*, Revised Statutes, 1979, Chapter 217.

Additional statutes that affect the ministry are:

- *Canada Shipping Act;*
- *Coal Act;*
- *Land Title Act;*
- *Mineral Act;*
- *Petroleum and Natural Gas Act;*
- *Condominium Act;*
- *Westcoast National Park Act;*
- *Okanagan River Boundaries Settlement Act;*
- *Petroleum Underground Storage Act;* and,
- *University Real Estate Corporation Act.*

Corporate commitment

- To manage and protect all Crown lands to ensure an appropriate supply of:
  - Timber to the forest industry; and,
  - Forage to the livestock industry;
- To encourage a vital, efficient and world-competitive wood-processing industry;
- To ensure the full use of resource values by British Columbians through integrated resource management;
- To supply forest recreation and manage wilderness values in provincial forests; and,

- To ensure that the province gets appropriate resource revenues from Crown forests, range and lands.

Corporate values

- To maintain a commitment to get results, through effective programs and financial responsibility, and to maximize job opportunities.
- To encourage public and private sector participation in determining and achieving ministry objectives.
- To respond to client needs through efficient, timely and courteous service and decentralized responsibility and accountability.
- To develop innovative and entrepreneurial management, through staff development, with emphasis on excellence.

Ministry goals

- To make timber available to the forest industry.
- To generate revenues for the Crown from timber harvesting.
- To ensure reforestation of Crown forest lands.
- To conduct research in forest renewal, forest productivity and decision aids, and integrated resource management.
- To protect the province's forest and range resources from damage by fire, forest insects and diseases.
- To make forage available to the livestock industry.
- To manage forage production for both domestic livestock and wildlife.
- To manage provincial forests for recreational and various other uses.
- To market Crown land for economic diversification and regional development.
- To sell/lease Crown land for the highest and best use and at a fair return to the Crown.
- To provide land grants for special public purposes.
- To purchase, exchange and dispose land for public benefit.
- To manage all Crown land cadastral surveys within the province.
- To inform various audiences about the ministry's mandates, goals, organization, policies, programs, products, services and achievements.

Reports

The Ministry of Forests Act and the *Ministry of Lands, Parks and Housing Act* require these reports to be prepared and considered by the government:

- A periodical forest and range resource analysis detailing the resource's conditions, management and future uses to enable the government to set overall priorities and long-term objectives;
- A five-year forest and range resource program report that sets schedules, methods and priorities for resource management and improvement to present the government's resource management intentions; and,
- An annual report describing the ministry's purposes and activities — including the money spent on them and information on their effects: whether the resources entrusted were well managed and whether value was received for money spent.

II. Program Reports

Introduction

For convenient comparative reading, the program reports follow, as much as possible, the structure of the provincial government's *Estimates* for the 1987-88 fiscal year.

The *Estimates* for the ministry include:

- Vote 34: Minister's Office;
- Vote 35: Ministry Operations;
- Vote 36: Fire Suppression Program;
- Vote 37: Forest Resource Development Agreement;
- A statutory special account for the Small Business Enterprise Program;
- A statutory special account for Forest Stand Management;
- Financial allocations — Section 88 (*Forest Act*) stumpage offsets; and,
- A statutory special account for Crown land projects.

The program reports focus on three of the above: i. Ministry Operations; ii. Fire Suppression Program; and, iii. Forest Resource Development Agreement. The Small Business Enterprise Program is included in the Harvesting Program report.

Ministry Operations

The sub-votes are:

- Administration and support services:
  - Senior executive direction;
  - Development and evaluation of policy objectives and plans;
  - Advice, policies and procedures pertaining to all general administration matters, support services throughout the ministry, overall monitoring and functional direction of the ministry's financial, human and physical resources, communications, data processing and administrative services, and arrangements for accommodation, equipment and maintenance — *Administration and Support Services Program* (**page 4**);
  - Dissemination of information concerning ministry activities -- *Public Information and Library Services* (**page 5**);
  - B.C. Debris Control Board; and,
  - Grants to agencies involved in forestry research and activities which promote the forest industry -- *Industry Development and Marketing* (**page 8**).
- Forests and Lands Management:
  - Program Administration:
    - advice, policies and procedures pertaining to program delivery at headquarters;
    - direction and monitoring of forests and lands policies and programs at regional level; and,
    - supervision and control of implementation at district level.
  - *Harvesting Program* (**page 9**) [and Inventory (**page 12**) funded under it];
  - *Silviculture Program* (**page 13**);
  - *Research Program* (**page 17**);
  - *Protection Program* (**page 20**);
  - The *Range Management Program* (**page 24**) and the *Recreation Management Program* (**page 24**), which are, in this report, incorporated under the umbrella of the recently established *Integrated Resource Management Program* (**page 24**); and,
  - *Lands Program* (**page 27**).
- Forest Stand Management Fund (Table E-9 and E-10) — the distribution of grants and contributions from the Forest Stand Management Special Fund established by the *Forest Stand Management Fund Act, 1986*; and,
- Crown Land Account (Table J-1).

Fire Suppression Program

This program (**page 31**) is authorized by Vote 36, which provides for the cost of fighting and extinguishing forest and range fires as required by the *Forest Act*, including *ex gratia* payments related to this program.

The sub-votes are:

- Direct fire-fighting expenditures; and
- Fire suppression preparedness.

Forest Resource Development Agreement

Provincial spending for programs under the five-year, $300-million, Canada-B.C. Forest Resource Development Agreement (**page 32**) is authorized by Vote 37.

Administration and Support Services Program

Program description and goals

The program's goals are:

- To develop systems, policies and procedures for the effective management of the ministry's human, financial and physical resources;
- To maintain and enhance the ministry's integrity, reputation and trusted relationships with central agencies; and,
- To contribute to the improvement and practicality of central agencies' systems and requirements.

The program's various components include:

- Financial services: to provide sound financial systems that are consistent with the *Financial Administration Act*'s control requirements;
- Human resources: to provide quality, integrated staff services through human resource planning, training, development, recruitment and selection;
- Technical and administrative services: to provide a comprehensive range of technical para-legal and specialized administrative services for the effective management of the ministry's facilities, equipment and electronic systems;
- Information systems: to provide effective and efficient computer information systems for the ministry's operations and access to other external government systems;
- Legal services: to co-ordinate all appeals and compensation claims under the *Forest Act* and *Range Act* and to advise ministry officials on legal matters or interpretation of legal documents; and,
- Audit services: to provide audit services to the executive and managers at all levels and to do independent, comprehensive and systematic evaluation of the ministry's programs and internal controls.

Client situation

The program's clients are the ministry's executive, managers and employees, the provincial government's central agencies, and the public.

Activities

During 1987-88, work was continued under the program:

- To simplify and improve the productivity and integration of the financial management systems and processes;
- To upgrade employees' skills;
- To increase the effectiveness and efficiency of the management of the ministry's facilities, equipment and electronic systems;
- To expand and integrate present information systems; and,
- To provide expert advice to ministry officials on legal, financial and technical matters.

Expenditures

Actual expenditure was $52.7 million. $2.6 million of this total was for employee benefits.

Public Information and Library Services

Sub-program description and goals

This sub-program, funded under the Administration and Support Services Program, co-ordinates the communication of information on the ministry's mandates, goals, organization, policies, programs, products, services and achievements internally to staff and externally to the public, organized groups, associations, the media, the forest industry, forest professionals, other government agencies, opinion leaders, universities and students.

It also provides:

- An information resource service to staff and the public; and,
- Consultation and advice to staff on communicating general information, internally and externally in an effective and efficient manner, on:
  - The forest resource, the ministry's forest programs, and forest issues; and,
  - Crown land grants, tenures, acquisitions, marketing, dispositions and exchanges.

Client situation

The public, the sub-program's main client, has a variety of concerns about the forest sector, according to a recent opinion poll.

Urban Canadians in the 18-to-44 age bracket were least aware and concerned about the importance of the forest.

The poll indicated that industry's performance in managing the resource was considered to be marginally higher (47 per cent) than the provincial government's (40 per cent).

With regard to perceived knowledgeability (credibility) on issues related to forestry, scientists had the highest rating at 7.57, on a scale of one to 10, followed by industry at 6.56, environmental groups at 6.45, and provincial departments at 5.79.

Activities

Communication plans

Annual communication plans were developed, approved, implemented, co-ordinated, and evaluated for the ministry, the Canada-B.C. Forest Resource Development Agreement, and the Canadian Council of Forest Ministers.

Print communications

Some 37 publications on a variety of topics were printed/reprinted and distributed to ministry offices throughout the province and to target audiences for dissemination to the public. Subjects included integrated resource management, fire prevention, forest management, reforestation, forest recreation, Crown land marketing, and aquaculture.

Also published were the *Five-Year Forest and Range Resource Program 1987-1992*, the ministry's annual report, newsletter and public discussion papers, seven different posters -- five on forest fire prevention -- and 23 recreation site maps.

During the year, 131 news releases on various topics were issued to the media by the ministry.

Visual/electronic communications:

Several new slideshows and video films were produced including:

- Two videos on the use of herbicides for vegetation management titled *The Trouble with Weeds* and *The Safe Application of Herbicides;* and,
- Two videos as part of the'Beware and Prepare' communication program on the problem of wildfires near forest homes: one for fire-fighting and emergency response organizations, the second for forest home dwellers.

The ministry's film and video library was transferred to a private distribution and marketing company to improve service to the public and ministry's client groups.

Media advertising

Newspaper and radio ads were placed to:

- Invite the public to official openings of new ministry facilities at Golden and Burns Lake and open houses during National Forest Week at forest region and district offices in many communities throughout the province; and,
- Increase public awareness of forest fire prevention.

B.C.'s official tree
In co-operation with the B.C. Forestry Association, the ministry organized a program to select a provincial tree.

A B.C. Tree Council was appointed, with representatives from all interest groups, to reach a consensus based on public input and to recommend a species for designation as B.C.'s official tree by the provincial government.

Nominations were invited through newspaper ads and 2,500 nominations were received.

More than 1,100 students from 37 school districts received a special certificate for participating in an essay contest for B.C. public school students in grades five, six and seven; 67 students -- grade winners at the school district level -- received a copy of the award-winning Canadian book, *The Forests of British Columbia;* 17 regional winners -- grade winners in each forest region -- were given an all-paid week in a forestry education camp in the province in the summer of 1988.

The B.C. Tree Council, after examining the nominations and reading the students' essays, recommended that the western redcedar (Thuja plicata) be designated the province's official tree.

The recommendation was accepted by the Minister of Forests and Lands and by the provincial cabinet. An order-in-council proclaimed the western redcedar as the official tree on February 18. To mark the occasion, a western redcedar tree was planted on the grounds of the legislature during a special ceremony.

'Green Gold Grants' program
The ministry co-ordinated the 'Green-Gold Grants' forest-awareness program launched in early 1987 under the Canada-B.C. Forest Resource Development Agreement.

Under the Green Gold Grants program, a total of $105,000 in funding was provided to 26 non-profit organizations throughout the province for forestry awareness projects, such as brochures for interpretative forests; portable displays for woodlot associations; forestry radio announcements; portable sawmill demonstrations at schools; a Knowledge Network TV program; a brochure on horse logging; and, slide tape shows.

Special events/promotions
- Official openings for two new ministry facilities were organized;
- Open houses were held at ministry offices throughout the province during National Forest Week;
- A new display on the B.C. Forest Service at the B.C. Forest Museum in Duncan was opened by the Minister of Forests and Lands in mid-July as part of the 75th anniversary celebrations of the B.C. Forest Service. The exhibit is housed in an old-style ranger station building.

Information resource services
An average of 100 phone calls from the public were handled daily relating to inquiries about ministry programs, products and services, referrals and requests for publications.

The ministry's library ordered and catalogued 1,406 new books, handled 5,828 reference questions, loaned out 4,007 items, conducted 114 data base searches, obtained 1,461 inter-library loans, distributed 2,000 reprints and implemented an integrated, automated library system.

Expenditures

Expenditure was $0.87 million, excluding employee benefits, contained under the Administration and Support Services Program (Table B-1). This does not include expenditure for projects implemented with other agencies or ministry programs under other funding sources, such as the Canada-B.C. Forest Resource Development Agreement.

Effects on clients

Inquiries and the demand for ministry pamphlets, brochures, maps, reports and other printed material indicated a keen interest by the public in the ministry's programs.

The sub-program's value was indicated in:
- the news media's use of ministry news releases; and,
- verbal and written responses to newspaper and radio ads.

Positive responses to slideshows, video films, special events and promotions demonstrated that the public viewed the program as necessary, educational and informative.

Forecasts

New directions in the way the province manages, charges for and renews its forests, announced by the Minister of Forests and Lands on September 15, 1987, will require new public information efforts in the areas of the small business forest enterprise program, silviculture, secondary forest products development and marketing, and privatization initiatives.

Industry Development and Marketing

Sub-program description and goals

This sub-program, funded under the Administration and Support Services Program, analyses opportunities for maintaining and expanding the forest products industry.

Its goals include:

- Minimizing trade barriers;
- Providing liaison for investors;
- Ensuring that industry proposals having the greatest economic merit are selected; and,
- Improving legislation to further the forest products industry's vitality.

Client situation

The forest industry accounts for over 45 per cent of the value of shipments from all manufacturing industries in the province. Approximately 75 per cent of the forest products are exported.

At the national level, the province accounts for approximately 40 per cent of some $20 billion of exports in the forestry sector.

The export markets are highly cyclical and subject to increasing pressures for protectionism.

Opportunities for stabilizing and expanding the industry exist in:

- Diversifying export destinations;
- Expanding specialty, secondary and tertiary milling of solid wood products;
- Updating the inventory of fibre suitable for pulp and paper products; and,
- Using previously noncommercial species, such as aspen and alder.

Activities

During 1987-88, the program's activities included:

- A review of the public's responses to the forest management review;
- Preparation of the ministry's five-year forest and range resource program;
- Important new directions in forest policy, implemented with substantive amendments to the *Forest Act* (1987: Bills 40 and 70; 1988: Bill 28);
- A 'Memorandum of Understanding' with the U.S. for replacement of the federal export charge on softwood lumber exports to the U.S.;
- Assistance to the Ministry of Finance and Corporate Affairs to facilitate rebates on export charges, where eligible under the terms of the 'Memorandum of Understanding';
- Meetings with numerous forest investors interested in joint ventures;
- Economic analysis of bid proposals for new forest licences and pulpwood agreements; and,
- Several fibre-supply analyses for potential manufacturing plants.

Expenditures

Budget allocation and actual expenditures for 1987-88 were both less than $1 million, primarily for salaries. Future increases are expected to reflect the importance of this program's goals and its increased emphasis on wood products research, manufacturing and international marketing.

Effects on clients

The forest industry is actively expanding, introducing new manufacturing processes and making use of fibre that was previously considered noncommercial.

Forecasts

The province's forest industry is expected to become more diversified and world competitive, with expanded trading in world markets.

Harvesting Program

Program description and goals

The program provides access to timber by engineering roads and bridges; allocating timber to industry members and individuals; and, scaling, valuation and billing of harvested timber.

The programs goals are:

- To administer timber harvests under the provincial allowable annual cut of about 72 million cubic metres; and,
- To generate revenues for the provincial government.

The Small Business Enterprise Program ensures that opportunities exist for small operators to enter and participate in the forest industry.

Client situation

The forest industry was generally optimistic, given a strong performance in 1987 and a favorable outlook for the immediate future, especially in the pulp and paper sector.

Total shipments were up by approximately 20 per cent to $11.4 billion, and the after-tax profits of 12 publicly traded companies based in the province more than doubled to a record $820 million.

A positive outlook is apparent in the level of intended capital and repair expenditures for 1988 — $2.4 billion, which exceeds the previous record year of 1987 by approximately 30 per cent.

Lumber

Lumber production increased by approximately 20 per cent to 15.9 billion board feet. Prices for spruce-pine-fir 2x4s averaged about U.S.$200 per 1,000 board feet (MBF), including the 15-per-cent export charge, with a range from roughly US$185 per MBF to US$220 per MBF.

The U.S. is the most important market for the province's lumber. Despite a drop in housing starts, from 1.8 million in 1986 to 1.6 million in 1987, consumption of lumber in the U.S. was at a record high.

The depreciation of the Canadian dollar made the province's sawmills much more competitive in offshore markets.

Combined with a strong housing market in Japan — the most important offshore market — this resulted in the coast sawmill industry producing at its highest level since 1978.

Pulp

Market pulp shipments were up by 15 per cent to a record 4.2 million tonnes. Prices for northern, bleached softwood kraft pulp continued the steady increase of the previous year, rising by approximately 24 per cent to US$680 per tonne in early 1988.

The Canadian and U.S. dollars' depreciation, relative to other currencies, greatly enhanced the competitiveness of the province's pulp industry.

Newsprint

Newsprint production increased by five per cent to a record production of 1.6 million tonnes. Prices rose by 16 per cent from US$514 per tonne to US$598 per tonne.

Plywood

Over 80 per cent of plywood produced is used domestically. The Canadian housing market was exceptionally strong in 1987 with 246,000 starts, the highest in the last decade. As a result, plywood production increased by 24 per cent to 1.9 million cubic metres (2.1 billion square feet, 3/8 inch basis).

Shakes and shingles

Exports of shakes and shingles decreased by 18 per cent in 1987 due to the import tariff imposed by the U.S. in June 1986.

The 35-per-cent duty, scheduled to be phased out over five years, is intended to provide import relief to U.S. producers and give them time to adjust to the competition from the province.

Activities

The program ensures an orderly timber harvest.

During 1987-88:

- 89 million cubic metres of timber were harvested from Crown and private land (Tables D-5 and D-6). This record harvest was 11 per cent higher than in the previous year;
- 11.5 million cubic metres — an increase of

32 per cent — were harvested from timber licences, federal and private land (Table D-5) which are not subject to allowable annual cut restrictions;
- The volume of Crown timber subject to allowable annual cut restrictions (Table D-11) was 72.9 million cubic metres. Salvage sales and an increased cut on some timber sale licences and timber licences account for the 4.6 million cubic metre difference between the allowable annual cut and the volume committed;
- Logs exported (Table D-8) increased by 68 per cent to 3.9 million cubic metres, reversing the trend of the previous two years. This upward trend reflects the strong offshore markets for logs and manufactured products; and,
- The Small Business Enterprise Program continued to grow during the year. Slightly more than 7.2 million cubic metres were harvested (Table D-4), an increase of nearly 13 per cent over 1986-87. This represents eight per cent of the total provincial harvest.

License administration

Table D-10 outlines the number of licences administered. Table D-11 indicates volumes committed by form of commitment.

The *Forest Act* defines 10 forms of rights to Crown timber. They range from long-term commitments, such as tree farm licences, to one-time-only commitments to individuals for firewood:
- Tree farm licences provide an allowable annual cut that is tied to a specified area. In many cases, private land is managed in conjunction with Crown land under this form of tenure. They have a 25-year term. They can be replaced, provided the licensee carries out responsible forest management as approved in a management and working plan;
- Forest licences have a 15-to-20-year tenure and are replaceable. They provide an allowable annual cut within a timber supply area, unlike tree farm licences, and are not tied to a specific area. A management and working plan requires the licensee to undertake certain silviculture activities. This form of rights to Crown timber accounts for nearly 55 per cent of volume committed;
- Timber sale licences (major) provide established operators with harvesting rights within a timber supply area. An allowable annual cut controls the volume harvested;
- Timber sale licences (minor) provide firms and individuals with harvesting rights to specific areas of timber. The ministry generally assumes the responsibility for overall planning, road construction, cruising and reforestation;
- Woodlot licences are 15-year, replaceable licences usually issued to rural residents. Their allowable annual cut is tied to a specific parcel of land. Often the licensee's private land is managed in conjunction with Crown land under one management and working plan; and,
- Pulpwood agreements provide wood-fibre processors the option to harvest standing timber in pulpwood areas if the supply of wood chips from other timber-processing facilities is insufficient. This ensures an uninterrupted source of wood-fibre to a processing facility.

A variety of other forms of rights to Crown timber — such as free-use permits, Christmas tree permits, and licences to cut — confer rights to harvest timber from Crown land. They are usually short-term and area-specific. They provide specific products, such as firewood, building logs, and fence posts to individuals, or allow removal of minor volumes of timber for such things as clearing minor rights-of-way.

Roads and Bridges

Over 830 kilometres of roads were constructed for a total inventory of over 30 300 kilometres of forest service roads (see Table D-12).

These roads are a major public asset. They provide access to provincial forest and range lands. Road improvement, upgrading and maintenance (Table D-13) took place on nearly 4 200 kilometres of these roads.

The number of bridges and major culverts — an integral part of the ministry's road network — increased to nearly 2,900 (Table D-14).

Building and maintenance expenditures for these roads and bridges was $35.9 million (Tables D-12, D-13 and D-14).

Forest revenues

Revenues, including stumpage collected from over 1,000 licensees, amounted to $536.3 million (Table D-2).

A new method for pricing timber, called the Comparative Value Pricing System, came into effect on October 1, 1987.

This new system raised the average price of Crown timber and contributed to the removal of the federal export charge on lumber.

It ensures a fair return from this major public resource and secures revenues which exceed government's expenditures to maintain and sell timber.

A revenue target, set by government, is distributed equitably among timber harvesters, taking into account production costs, the value of products produced and changing market conditions.

Expenditures

Budget allocation expenditure was $83.6 million; actual expenditure was $87.4 million (Table D-1).

Expenditures under the Small Business Enterprise Program increased to $14.8 million in 1987-88, up 20 per cent from the previous year.

Funding for the program was provided from the Small Business Enterprise Account, which consisted of the bonus bids, paid in addition to appraised stumpage, from sales of timber under the program.

Effects on clients

The forest industry harvested a record 89 million cubic metres of timber and produced record amounts of lumber, pulp and newsprint.

Stumpage charges were the main source of revenues collected. Stumpage charges for non-competitive licences averaged $5.89 per cubic metre, up 105 per cent from the previous year (Table D-3). Total stumpage billed for competitive licences increased by more than 40 per cent (Table D-4).

Forecasts

The outlook for the forest industry is generally positive. Demand for the three major products — lumber, pulp and newsprint — is expected to remain strong through 1988-89.

Inventory

Sub-program description and goals

This sub-program, funded under the Harvesting Program, provides:

- Current statistics through periodic re-inventory and depletion updates;
- Forest-cover digital files with geo-referenced inventory data;
- Timber supply analysis to determine the allowable annual cut of timber supply areas, and reviewing management and working plans for tree farm licences; and,
- Development and calibration of growth models for the projection of forest stands for resource analysis.

The goals were:

- To update inventory depletion for 700 forest cover maps and area statistics files;
- To digitize 200 forest cover maps and to update 400 previously digitized maps;
- To produce volume and decay coefficients and new area and volume data files for 12 timber supply analyses;
- To review 17 timber supply analyses for tree farm licences;
- To provide forest cover and digital graphic files to ministry and private sector clients for 600 forest cover maps; and,
- To provide 300 area and volume reports and 600 colored forest cover maps in response to special requests.

Client situation

The sub-program's clients are resource managers and planners in forestry from the private and public sectors.

The existing forest resource inventory was developed over the past 25 years and statistics were produced by public sustained yield units to determine the allowable annual cut. Thus the sampling system provided average volumes, which are reliable for large forest units but not for individual stands of trees.

Refinements — such as the use of site index equations, adjustments for species composition, and realistic estimation of stand density and/or stocking — in the classification system are needed to derive stand-specific volume estimates for the clients.

Statistics are provided to managers and planners in the forest districts who require the inventory data for their programs.

Activities

During the year these projects were accomplished:

- An inventory depletion update of 529 forest cover maps and area statistics files;
- Digitizing of 207 new forest cover maps and updating of 400 previously digitized maps;
- Volume and decay coefficients for 12 timber supply analyses;
- New area and volume data files and analysis for 10 timber supply areas;
- Review of 17 timber supply analyses for tree farm licences;
- Forest cover and digital graphic files for 820 forest cover maps for ministry and private sector clients; and,
- 290 area and volume reports and 700 color forest cover maps to meet special requests.

Expenditures

From 1982-1987, funding for the sub-program was through the harvesting program and provided only for maintenance of the inventory. Cyclic re-inventory, essential for a current data base, was not carried out. However, most maps were updated using satellite image analysis and classification was refined in selected areas.

Forecast

The sub-program will:

- Analyse each timber supply area and tree farm licence every five years;
- Re-inventory each timber supply area and tree farm licence every 10 years;
- Update each forest cover map and corresponding statistics every two years;
- Maintain permanent sample plots for the development of growth projection systems and the supply of realistic growth models for timber supply analysis;
- Convert all forest cover maps into digital form by 1991; and,
- Implement forest resource inventory data on a province-wide geographic information system in each forest district by 1991.

Silviculture Program

Program description and goals

The program involves the restocking of denuded forest lands and improving the value and productivity of forest stands through silvicultural treatments, as follows:

- Harvested areas or lands denuded by wildfires and pests (hereafter referred to as denuded lands) are restocked through planting and natural seeding;
- Site preparation is used to promote natural restocking and to facilitate planting;
- Brushing is carried out on some plantations to ensure unimpeded seedling growth; and,
- Spacing, fertilization and conifer release are undertaken to improve the value and productivity of selected forest stands.

The program also includes seed and nursery operations, which provide seeds and seedlings for reforestation.

The program has four components:

- Basic silviculture;
- Incremental silviculture;
- Nursery operations; and,
- Seed operations.

Goals for each component are given in each activity section.

Client situation

The program's general client group — the province's forest industry — and its specific clients — the silviculture contractors — were used to the fullest extent during the year in the delivery of many field activities under the program.

Except for surveying, field operations for all ministry activities were done by contracting 100 per cent of the work to the private sector.

Activities

All activities increased significantly over previous years.

A record 200 million seedlings were planted — a 43-per-cent increase over the 1986-87 planting level.

Total seedlings planted annually has doubled in the past six years.

The planting on Crown and private forest lands were:

Land status	Millions of trees	Hectares planted
Crown land	195.8	164 044
Private land	4.2	4 958
TOTALS	200.0	169 002

About 82 per cent of this planting was on lands recently denuded (basic silviculture); the rest was on lands denuded and untreated for morethan a few years (incremental silviculture).

Basic silviculture

This component involves restocking forest land recently denuded by timber harvests, wildfire, and pests. Activities include surveying, site preparation, planting, and brushing.

Accomplishments on Crown lands, relative to goals, were:

Activity	Goals[1]	Accomplishments
	---------- hectares ----------	
Surveys	60 000	386 594
Site preparation	130 000	148 582
Planting	130 000	134 931
Brushing[2]	25 000	17 908

1. *Five-year Forest and Range Resource Program, 1987-1992.*
2. Ministry funds only. Additional accomplishments are presented in Table E-9.

During 1987-88, ministry and licensees were responsible for:

- Surveying about 387 000 hectares of recently denuded lands (Table E-2) to identify and plan for silviculture treatments;
- Carrying out site preparation — 44 per cent of this activity in the Prince George forest region — on about:
  - 24 000 hectares to promote natural reforestation; and,
  - 124 500 hectares for planting. (Tables E-3 and E-4 detail the site preparation carried out on crown land);
- Planting about 161 million trees on 135 000 hectares of recently denuded Crown lands, much more than in previous years (Table E-5 details the area and number of trees planted in each forest region);

- Planting an additional 4.2 million trees on about 5 000 hectares of recently denuded private lands (Tables E-6 and E-7 detail the number of trees and area planted, by land status and responsibility for planting); and,
- Brushing treatments to control undesirable vegetation in young stands on about 18 000 hectares. Brushing has increased over the last 10 years and further increases are anticipated. ministry studies indicate about 80 000 hectares need to be treated annually to protect initial silviculture investments and to ensure unhindered tree growth.

Table E-11 gives average costs of basic silviculture treatments.

Incremental silviculture

This component involves restocking the backlog of not-satisfactorily-restocked forest land, and improving the immature forests' value and growth. Activities include surveying, backlog planting, spacing, fertilization, site rehabilitation, brushing, thinning and conifer release.

Accomp! shments, relative to goals, on Crown forest lands in 1987-88 were:

Activity	Goals[1]	Achievements[2]	Additional Achievements[3]	Total
	hectares			
Surveys[4]	171 964	203 215	-	203 215
Site rehabilitation	35 848	27 943	499	28 442
Backlog planting	31 433	29 113	-	29 113
Brushing	7 285	6 855	4 506	11 361
Conifer release	2 068	1 254	1 360	2 614
Spacing[5]	20 183	21 143	11 141	32 284
Fertilization	13 547	13 697	39	13 736

1. Revised goals determined by the Canada-B.C. Forest Resource Development Agreement's management committee.
2. Accomplishments under the Canada-B.C. Forest Resource Development Agreement.
3. Includes accomplishments under federal and provincial job creation programs and ministry funds.
4. Does not include aerial surveys.
5. Includes juvenile spacing and sanitation spacing.

This section summarizes incremental silviculture activities funded under regular ministry programs (The Canada-B.C. Forest Resource Development Agreement, the Ministry Vote and Section 88 of the *Forest Act*), the Forest Stand Management Fund, and the Canadian Jobs Strategy Program. Accomplishments under the Canada-B.C. Forest Resource Development Agreement are described on pages 31 and in Table L-2.

- During 1987-88, under regular ministry programs, ministry staff and contractors:
- Planted about 35 million seedlings on more than 29 000 hectares, a 40-per-cent increase over 1986-87;
- Treated about 77 000 hectares of Crown lands to improve the value and productivity of forest stands;
- Brushed 6 800 hectares (in addition to the area treated under basic silviculture) under the Canada-B.C. Forest Resource Development Agreement; and,
- Carried out other activities, such as pruning, mistletoe control, the falling of snags and residual trees, sanitation treatments and seed-tree elimination on about 11 000 hectares.

Additional accomplishments were also achieved under the Forest Stand Management Fund and the Canadian Jobs Strategy Program.

More details on incremental silviculture activities are given in tables E-2 (surveys), E-5 (planting), E-9 (brushing), and E-10 (spacing, fertilization, site rehabilitation, conifer release, commercial thinning and other).

Nursery operations

The provision of seedlings for reforestation has been undergoing a gradual evolution: from all seedlings being grown in ministry nurseries to the majority being grown in private sector nurseries.

Before the fiscal year, a policy decision limited ministry nursery production to 100 of the 200 million seedlings required annually. The remainder was grown under contract with the private sector.

During 1987-88, nine of the 11 ministry nurseries were offered for sale to the private sector as part of the government's privatization program. As of March 31, 1988, this offer was still in progress.

During 1987-88:

- 197 million seedlings — 87 million in ministry nurseries and 110 million in private nurseries — were sown, with most scheduled for planting in 1988-89;
- About 81 per cent (or about 159 million seedlings) of the 197 million total seedlings were sown in containers, the rest as bareroot stock; and,
- One-year-old, container-grown spruce was the most requested stocktype (about 63 million seedlings).

Ministry nurseries
To compete successfully with brush on productive sites, larger and more mature planting stock must be used.

To increase the supply of larger planting stock, container operations were expanded to produce more two-year old container seedlings.

During 1987-88, ministry nurseries:

- Sowed for 87 million seedlings, of which 25 million were two-year container seedlings; and,
- Shipped 100 million seedlings for planting (see Table E-13).

Private nurseries
During 1987-88:

- Commercial and forest company nurseries sowed for about 110 million seedlings (five million were bareroot seedlings);
- Forest company nurseries sowed for 27 million seedlings; and,
- Private nurseries shipped 101 million seedlings for planting in the 1987-88 season (see Table E-13).

Seed operations
This activity provides seed for all nurseries.

Sources of seed include collections from natural stands, seed orchards, and occasionally purchases from out-of-province suppliers for operational and research use.

During 1987-88:

- There was a light crop in natural stands and moderate crop in seed orchards. A total of 2 671 kilograms of seed were added to the provincial seed inventory;
- 3 980 kilograms of seeds were withdrawn leaving an anticipated inventory of 42 321 kilograms of all native species upon completion of the 1988 spring sowing (see Table E-12);
- A total of 44 seed orchards spanning 123.4 hectares were managed under co-operative orchard programs. The ministry manages 22 orchards (74.0 hectares); industry 22 orchards (49.4 hectares).
- Amendments to the *Forest Act*, requiring major licensees to pay for the seed cost, is having a major impact on the co-operative orchard program. The ministry served notice in February, 1988, that effective May 31, 1990, the seed orchard agreements, which granted funding to industry-managed orchards via credits against stumpage accounts, would be cancelled. In the interim two-years, funding support for orchards will continue under direct contracts with the ministry. Tree improvement councils actively considered alternate future funding mechanisms.

New silviculture legislation
In December 1987, the *Forest Act* was amended to require major licence holders to carry out basic silviculture, at their own expense, on land from which timber is harvested.

Holders of replaceable timber sale licences greater than 10 000 cubic metres, or issued under a pulpwood agreement or a pulpwood harvesting area agreement, tree farm licences, woodlot licences, forest licences, timber licence, or timber sale harvesting licences are required, at their own expense, beginning October 1, 1987, to:

- prepare a pre-harvest silviculture prescription detailing the harvesting and basic silviculture treatments which will be carried out on every area proposed for logging;
- receive approval for the pre-harvest silviculture prescription from the forest district manager;
- carry out harvesting and basic silviculture treatments according to the standards set out in the pre-harvest prescription;
- conduct silviculture treatments within specific time frames; and,
- establish a crop of healthy ecologically suitable and commercially valuable trees, the growth of which is not impeded by competition from plants, shrubs or other trees.

As of March 31, 1988, regulations pursuant to these amendments were pending.

Expenditures

Budget allocation under the Ministry Operations Vote, Section 88, the Forest Stand Management Fund, and the Small Business Enterprise Program was $168 million; actual expenditure was $158.9 million, including employee benefits.

The major portion of this indicated under expenditure is attributed to the transfer of approximately $4 million from the Forest Stand Management Fund to other ministry programs.

Much of the remaining under-expenditure was a result of ministry decisions to reallocate funds internally.

Expenditures were:

- $9 million under the Small Business Enterprise Program;
- $14.4 million under the Forest Stand Management Fund;

- $82.9 million under Section 88 of the *Forest Act;* and,
- $52.6 million under the Ministry Operations Vote.

Under the Canada-B.C. Forest Resource Development Agreement, $62.4 million in cost-shared funds were available for backlog reforestation, intensive forest management, and implementation, communications and evaluation. See the report on the Forest Resource Development Agreement **(page 32)** and tables on actual expenditures and accomplishments **(page 3)**.

Effects on clients

During 1987-88, the increased program goals resulted in record levels of reforestation, stand tending and forest land improvement. This resulted in increased productivity and value of provincial forests.

Record numbers of persons were employed in silviculture in 1987-88:

- The programs funded by the Ministry Operations Vote, Section 88, and Small Business Enterprise Program created 620 000 person-days of employment.
- The Forest Stand Management Fund provided funding for the Forestry JOBTRAC Program and 175 000 person-days of employment were created.
- The Canada-B.C. Forest Resource Development Agreement program created an estimated230 000 person-days of employment.
- 1.2 million person-days — or 4 900 person-years — of employment were created in the Silviculture Program in 1987-88 if all funding sources are considered.
- Additional jobs were created by the Federal Jobs Strategy Program.

Forecasts

The program will continue to expand. There will be more work than ever before for the forest industry and silviculture contractors.

Increased amounts of the backlog of denuded forest lands will be reforested and existing stands will be improved in productivity and value.

Research Program

Program description and goals

The program addresses complex forest resource management issues by providing research support to achieve the ministry's operational goals and transferring research findings into operational practice.

The goals are:

- Forest renewal research: to meet the challenge of forest renewal through research in seed and stock improvement, regeneration and forest establishment.
- Forest productivity and decision aids research: to ensure that stand-tending treatments and forest-management decisions are as effective as possible.
- Integrated resource management research: to address key forest and range resource problems, taking into consideration the impact of forestry practices on wildlife and fish habitats, climate, soils, hydrology, recreation and the visual landscape.

Client situation

Programs are directed by client advisory committees, including the provincial and regional research advisory committees, coast and interior tree-improvement and forest-productivity councils and the nursery technical committees.

Many co-operative projects are underway with the forest industry and other agencies and institutions throughout the province, including the University of B.C., Simon Fraser University, the University of Victoria, the Canadian Forestry Service, Agriculture Canada, Fisheries and Oceans Canada, the Ministry of Environment, Forest Engineering Research Institute of Canada, FORINTEK Canada Corporation, the U.S. Forest Service, and several special interest groups.

Activities

The program has three sections — forest renewal, forest productivity and decision aids, and integrated resource management — and are complimented by three support sections: finance and administration; communications and extension services; and, technical support services.

Forest renewal research

Projects to increase the performance and genetic quality of tree seed and the survival and growth of replanted trees to the free-growing stage were continued. Their aim is to achieve forest renewal objectives and assure future wood supply.

Accomplishments include:

- A container seed orchard operations manual was prepared;
- Interim guidelines for interior spruce pollen management in seed orchards were completed;
- 30 million genetically improved interior spruce seeds were produced for operational use;
- Tree pruning treatments were developed and are now being applied at the Lost Lake western hemlock seed orchard;
- A stem injection treatment was successfully applied and it improved the genetic quality of seed from ministry seed orchards; and,
- Reforestation research on unsatisfactorily restocked land was expanded through support from the Canada-B.C. Forest Resource Development agreement:
  - Emphasis on the extension and demonstration of backlog reforestation research information was increased;
  - Workshops with the northern and the southern interior silviculture committees and the Carnation Creek herbicide impact studies were conducted;
  - Six new site preparation demonstration areas were established; and,
  - A video on the effectiveness of mechanical site preparation was prepared.

Forest productivity and decision aids

- A comprehensive computer program capable of simulating the growth of stands, sawing logs and assessing the end product value was used to evaluate silvicultural treatment options in terms of financial return;
- Analysis work began on the province's largest designed fertilization and thinning program;
- Site index curves for Douglas-fir, hemlock, cedar, amabilis fir and alder were adapted by the growth-and-yield program for use in coastal forests; results will be published

as a Canada-B.C. Forest Resource Development Agreement report;
- Re-measurement, analysis and reporting of backlog data from older growth-and-yield installations is continuing;
- Progress was made in establishing new long-term, high-quality growth and yield research installations to address obvious data deficiencies in lodgepole pine and white spruce, especially the spacing at time of planting, juvenile spacing and fertilization;
- A prototype forest-level planning aid was developed and published to facilitate impact assessment of pests affecting timber supply and allowable annual cut allocations;
- Savings of close to $300,000 for the fiscal year were identified through assessment of seedling shipping patterns from nurseries to the field;
- Approximately 280 coastal growth and yield plots were re-measured; and,
- Two extension reports, based on commercial thinning experiments on Vancouver Island, were published.

Integrated resource management research
- Ecosystem classification was continued and further management interpretations for harvesting and silviculture were devised to reduce site degradation and to maintain or enhance forest and range productivity throughout the province;
- Several maps and field guides based on ecosystem classification were produced;
- Wildlife habitat research, primarily through the Integrated Wildlife Intensive Forestry Research program, continued to examine timber harvesting impacts on Vancouver Island wildlife; mule deer winter range and grizzly bear habitat studies were continued and procedures for integrating wildlife and forestry management were developed and explained to users;
- Fish-forestry interaction research was reported in several *Land Management Reports* and effected policy changes to coast-logging guidelines;
- Tools and training packages for integrated resource use were transferred to managers, including a preliminary workbook to facilitate the assessment of hydrological sensitivity and thereby prevent serious changes to the hydrological regimes of watersheds due to timber harvesting;
- Research on the effects of knapweed density on grass productions was carried out;
- Reports on research into rates, types, and dates of fertilizer applications on grass yields were prepared; and,
- A study on the impacts of grass and cattle on tree establishment and growth was continued.

Communication and extension services:
Effective communication and technology-transfer supports, such as slides, posters, overheads and display panels, were produced and a research information service was provided for scientists and researchers:
- Three *Forest Report* newsletters were published;
- More than 36 different brochures, pamphlets, maps and newsletters were produced; and,
- More than 1,400 mail and phone requests for research publications were handled and over 500 publications were sent out in response to requests.

Technical support services:
- Equipment was updated, under Canada-B.C. Forest Resource Development Agreement, in the analytical chemistry laboratory;
- Field equipment and research station buildings were upgraded;
- Statistical analysis system training has increased researchers' knowledge and use of statistical applications for data analysis; and,
- Increased computing power is now available to scientists through the acquisition of micro computers to analyse and report research data and findings.

Expenditures

Budget allocation was $15 million, including $5.7 million for the Canada-B.C. Forest Development Agreement; actual expenditure was $14.7 million, including $5.2 million for the Canada-B.C. Forest Development Agreement.

The program's cost increased from $10.1 million in 1986-87 to $14.7 million in 1987-88.

Effects on clients

Forest renewal research
Client problems were addressed through the production of 30 million genetically improved spruce seeds and the successful treatment, and consequent genetic improvement, of the seeds of the other commercially valuable species.

Forest productivity and decision aids research
The production of managed-stand yield tables and site-index curves enabled clients to make informed management decisions and to improve stand-tending treatments.

Integrated resource management research
Clients derived benefits through informed management decisions made possible through expanded ecosystem classification.

Similarly, clients benefited from the development of a recommended procedures to integrate wildlife and forestry management.

A workbook on the prevention of changes to watersheds as a consequence of timber harvesting is another client benefit.

Forecasts

- The demand for research solutions, especially those addressing critical forest management issues, has increased steadily over the past five years. This trend is expected to continue.
- Ensuring a future wood supply will continue to be the driving force behind forest renewal research.
- In addition to addressing effective reforestation and ecological site assessment, integrated resource management research will also focus on the management of wilderness and fish and wildlife habitats, in concert with public access and non-timber useage.
- The program will continue the trend toward contracting research and co-operating with other government agencies and universities to address client-oriented, high-impact problems and to deliver workable solutions.

Protection Program

Program description and goals

The program involves:

- Protecting the province's forest and range resources from damage by fire, forest insects and diseases;
- Protecting life, property and other natural resource values from fire; and,
- Supporting silviculture site treatments and range and wildlife habitat creation and maintenance through the use of prescribed fires.

Fire control responsibilities during the fire detection and initial attack phases are primarily carried out by ministry staff and their contractors. Forest industry staff are responsible for initial attack on a small percentage of provincial fires.

The forest industry, and, to a lesser extent, the construction industry, supply men, material and heavy equipment during the extended fire-fighting phase.

Senior forest industry staff are used in the fire control organization depending on training and skills.

The program provides management personnel, operational staff and most initial-attack resources to achieve fire-management goals.

Prescribed burning goals are achieved by the forest industry and the ministry.

The goal for fire management activities, as indicated in the *Five-Year Forest and Range Resource Program, 1987-1992*, is to limit annual area burned to 69 000 hectares and timber loss to 2.6 million cubic metres.

This goal was achieved in 1987-88: the area burned was nearly 35 000 hectares and timber loss was about 1.8 million cubic metres.

The goal for pest management activities is to reduce losses of timber due to insects and diseases.

During 1987-88, defoliators and bark beetles attacked over one million hectares resulting in a loss estimated at 7.2 million cubic metres. The annual loss due to root rots and mistletoes is estimated at eight million cubic metres.

Client situation

Primary clients are other ministry programs and other provincial and federal government programs. British Columbians are served through forest fire control and pest management services.

Activities

Fire Management

This includes all activities relating to fire-fighting preparedness, forest-fire prevention, and organizational support for forest-fire suppression.

During 1987-88:

- The ministry's forest fire detection systems were maintained; the lightning location system was extended through the sharing of direction finder sites with other agencies and the upgrading of site equipment;
- Public assistance in detecting and reporting forest fires was encouraged through media ads and the Zenith 5555 toll-free phone number and support continued to be at a high level;
- Fire prevention programs were continued, including school programs and the use of the reward system for arson fire information; 'Smokey Bear' made numerous appearances across the province with the purchase of five 'Smokey suits';
- Fire-fighting equipment was updated and improved;
- The fire-suppression training program was expanded: four new courses were produced and basic courses were updated;
- Emphasis was continued on initial attack capabilities: four contract regional helitack crews were placed in the Prince Rupert, Kamloops, Nelson, and Vancouver forest regions to supplement existing forces and additional training was provided for the initial attack crews;
- The fireline certification policy and overhead team program were improved: the computerizing of fireline certification was done and overhead teams received additional training and experience; and,
- Prescribed fire, in support of the goals of other programs, was used as a treatment on 122 553 hectares as follows:

	Hectares	Per cent
Hazard abatement	3 484	3
Silviculture treatment	70 217	57
Wildlife habitat improvement	39 732	32
Range improvement	8 900	7
Other	160	1
TOTALS	122 553	100

Pest Management

This includes all activities associated with insect and disease management.

During 1987-88:

- Surveys were conducted to detect and quantify pest infestations; the major insect infestations identified and assessed included:
  - The western spruce budworm outbreak, which expanded in the Kamloops forest region to cover more than 800 000 hectares; and,
  - The blackheaded budworm outbreak on the Queen Charlotte Islands and near Kitimat, which declined in many areas to about 14 000 hectares of defoliation;
- Damage appraisal programs were initiated to determine actual losses caused by the western spruce budworm and the blackheaded budworm: permanent sample plots were established in representative damaged and undamaged stands and were monitored;
- Province-wide surveys for gypsy moth were conducted in co-operation with Agriculture Canada and the Canadian Forestry Service;
- Surveys of young stands were conducted to assess levels of damaging insects, such as terminal weevils;
- The emergency bark beetle program was continued (the mountain pine beetle remained the most damaging forest insect in the province with 200 000 hectares under attack); the infestation declined in several areas due to adverse winter conditions and the aggressive program. Expenditures of $8.6 million funded or supported activities similar to past years, including access development, surveys, suppression treatments, and harvesting according to priorities;
- A survey of the pinewood nematode in sawmill wood chips was conducted in co-operation with Agriculture Canada Plant Health, Burnaby; the nematode was found throughout B.C. and its occurrence restricted wood chip exports — amounting to $10 million in potential sales — to Scandinavian countries; this nematode does not cause damage to forest stands in B.C.; work with the B.C. Plant Protection Advisory Council and other provincial and federal agencies and the B.C. Council of Forest Industries is continuing to avoid further restrictions of other forest product exports to the European Economic Community;
- Approximately 1 200 hectares were treated with the biological insecticide *Bacillus thuringiensis* to test its effectiveness against the western spruce budworm in the Kamloops forest region. This trial included a retreatment of 200 hectares in the Paul Lake Provincial Park;
- Pest management projects, funded by the province under the Canada-B.C. Forest Resource Development Agreement, included:
  - Control trials, surveys and development of regional strategy to prevent or reduce damage from porcupines in young spaced stands;
  - Control trials and surveys of tomentosus root rot of spruce and of armillaria root disease of Douglas-fir and other tree species in interior forests;
  - Evaluation of laminated root rot on permanent sample plots in coastal, young Douglas-fir stands, in relation to soil characteristics and ecological associations;
  - Re-measurements of control plots established for assessment of falling and burning individual trees infested by mountain pine beetle, monitoring leader weevil of spruce, and pruning young, white pine trees to protect them from blister rust;
  - Establishment of a demonstration area for white pine trees showing resistance to blister rust;
  - Spacing trial for larch infested by dwarf mistletoes and an analysis of dwarf mistletoe effects on form of lodgepole pine; and,
  - Evaluation of a computer root disease model for infested stands, and development of a model to assess pest effects in a timber supply area;
- Protection Manual *Volume 2 Pest Management* was issued to regional, district and other offices. It outlines background infor-

mation and procedures on major forest pests and pesticides; and,
- The ministry representative on the B.C. Pesticide Control Committee reviewed 448 forestry-related, pesticide-use applications and made recommendations to the Ministry of Environment and Parks: 214 of these applications were from the ministry and 234 were from the forest industry;

Air Operations
Total ministry expenditure for aircraft and aviation support services for all ministry programs was $28.4 million:
- $4.4 million on forest-protection flying, fertilizing, seeding, spraying, pest management,
and other forestry field activities; and,
- $24 million on fire suppression aviation:
  - $22.8 million for fire-suppression flying, air-tanker flying, helicopters, aerial detection and transport; and,
  - $1.2 million for air tanker base operations and development.

Air tankers worked 709 targets (20.4 per cent of total fires), providing initial action or support to ground forces on fires.

Air-tankers were released to assist Saskatchewan and the Northwest Territories.

Capital works projects undertaken were:
- New dispatch offices at Cranbrook and Penticton;
- A new retardant storage and workshop facility at Smithers; and,
- Major improvements at Kamloops, Blue River, Pentiction, Burns Lake, Cranbrook and Williams Lake.

The air tanker evaluation grid was used to evaluate drop patterns of the Firecat air tanker with an advanced design tank.

Planning, development, and research
Technical and related support were provided in fire-management information systems, prescribed fire use in forest management, pest management in forest planning, weather data collection, and the provincial lightning-location system:
- All regions, districts and some forest industry users were given access to the protection information system for decision-making and analytical procedures in fire weather, fire reports, lightning location, fireline certification, and pesticide-use components;
- Development of fire-management decision-support tools continued through the addition of the Prince Rupert forest region to the values system — it provides a description of the forest fuels, associated timber values, and the assessed value of private property and structures, and the provision of property location data for the central land registry system; the advanced fire management system was provided to two regions and two districts for operations use and prototyping;
- The prescribed fire management information system, funded through the Canada-B.C. Forest Resource Development Agreement, documented 38 prescribed burns in logging slash fuels; and seven training sessions were held in four forest regions at which 50 persons from 16 districts and forest companies were trained and equipped;
- A prototype pest management project tracking system led to:
  - A reassessment of the silviculture history record system as the principal tool for tracking pest management projects;
  - Development of a strategy to integrate the Canadian Forestry Service's forest insect and disease survey data with the operational requirement of tracking bark beetles and defoliators; and,
  - Negotiations to link the computer facilities of the Canadian Forestry Service and the ministry;
- A five-year development plan for a provincial fire weather network was drafted and approved; three weather networks were established to test the system's operations. In conjunction with Forest Technology Systems Ltd. of Victoria, a modem was designed to permit transfer of weather data by phone lines to the VAX computer at B.C. System Corporation.
- The lightning location system was enhanced through the addition of four new direction finders at Nighthawk, Anahim Lake, Pemberton, and Nass Camp. The Attick Creek site was converted to the new advanced lightning direction finder; the total now consists of 24: 19 direction finders in B.C. and five shared with the Yukon Territory and Alberta.

Expenditures

Budget allocation was $24.5 million; actual expenditure was $25 million; the program accounted for 4.7 per cent of the ministry's expenditure.

Effects on clients

By achieving its goals, the program had a positive impact on its clients. No adjustments to projected harvesting plans were required.

Forecasts

The prescribed burning program is expected to level out during 1988-89.

The spruce budworm outbreak near Kamloops will continue to spread marginally with specific control measures being required for small areas.

Defoliation is expected to be less severe in 1988-89.

Integrated Resource Management Program

Program description and goals

The program manages range and recreation resources, integrates their management with timber production and other provincial resources and co-ordinates the forest planning process.

This involves:

- Preparing integrated resource plans;
- Maintaining a dialogue with resource agencies, forest and ranching industries, and the public on objectives and management priorities;
- Ensuring sound stewardship of forested and non-forested Crown rangelands;
- Administering range tenures for forage-use by livestock and getting a fair price for Crown forage;
- Protecting provincial forests' recreational values, including landscape aesthetics; and,
- Providing recreation sites and trails in provincial forests for public use.

Client situation

The program serves diverse clients by setting standards of resource stewardship and in the production of management plans.

Major clients are the resource and tourism industries, other resource agencies, and the public.

Beef cattle producers and guides and outfitters have access to rangeland forage, which provides almost one million months of grazing for livestock. Additional forage is used by numerous wildlife species.

Developed recreational sites and trails in provincial forests support 1.9 million user visits. Another 15 million user-visits are dispersed over the provincial forest land.

Activities

There are three activities — resource planning, range management and recreation management. Each has its own mandate, but the activities complement each other in achieving a holistic approach to resource management.

Resource planning

Resource planning achieves integrated resource management by:

- Preparing strategic and local resource-use plans;
- Co-ordinating inter-agency dialogue;
- Consulting the public on forest resource planning;
- Addressing environmental protection issues; and,
- Recommending timber harvesting rates.

Plans are prepared or approved for:

- 35 timber supply areas;
- 31 tree farm licences; and,
- More than 200 local resource-use plans.

In 1987-88, the allowable annual cut was 52.8 million cubic metres from timber supply areas and 18.6 million cubic metres from tree farm licences.

The actual annual harvest deviates from the allowable annual cut due to market demand, but is required to meet cut control limits over a five-year cut control period.

Range management

This activity emphasizes the protection and conservation of range lands' ecosystems while providing for their use by livestock, wildlife and other resource objectives.

Cost-effective management initiatives were used to enhance forage production and improve quality.

During 1987-88:

- Grazing permits (1,783) and licences (367), and hay-cutting permits (58) and licences (96) were administered;
- Grazing permits and licences for livestock authorized 987,704 animal-unit-months, 5,455 animal-unit-months less than in 1986-87;
- Range ground rent, at 20 cents per animal-unit-month, was the same as in 1986-87, but the grazing fee (related to the previous year's cattle prices) increased from $1.15 to $1.27 per animal-unit-month;
- Table H-4 details range improvements on Crown Lands; those financed without provincial assistance are not included;
- 9 701 hectares of disturbed forest and 2 047

hectares of grassland were seeded for grazing and to control erosion;
- Weed control — principally for knapweed and thistles — was carried out on 1 072 hectares;
- Research was continued on the biological control of knapweed and other weeds;
- A range inventory project was continued in the Nelson forest region;
- Policies on livestock over-wintering, commercial horse operations, and award of new tenures were drafted; and,
- Procedures for environmental monitoring in range and wildlife habitat management were drafted in cooperation with the environment ministry's wildlife branch.

Recreation management

This activity provides the public with opportunities for recreation experiences in provincial forests.

It protects and manages the use of recreational values, including the forest landscape's wilderness and aesthetic values.

It provides recreational sites and trails for the public's use.

During the year:
- The activity's scope and purpose was clarified in a mission statement, in the setting of objectives, and through the identification of specific services to be delivered;
- An amendment to the *Forest Act* gave the ministry the responsibility to manage wilderness within provincial forests, so a discussion paper on wilderness policy was prepared to interpret the new legislation and implement the new mandate;
- Improvements to the provincial wilderness inventory were initiated, based on the recreation features and recreation opportunity spectrum inventories;
- Landscape management continued to gain support and by year's end five of the six forest regions had landscape foresters on staff; and,
- 1,180 recreation sites and 7 995 kilometres of trails were maintained — primarily through job-creation programs and voluntary contributions from recreational users.

Expenditures

Although the program was established in 1986/87, the 1987-88 budget *Estimates* **(see page 3)** continued to fund the program through segregated programs: Recreation Management Program, Range Management Program, and part of the Harvesting Program (resource planning). These funding components have been aggregated as a single program below.

In Tables 1, H-1, and I-1, the funding by activity for Range Management and Recreation Management can be compared to the *Estimates* for 1987/88.

There was an expenditure of $1.724 million on resource planning funded under the Harvesting Program.

Budget allocation for the range and recreation management activities under the Integrated Resource Management Program was $8.776 million; actual expenditure for range and recreation management was $11.01 million; approximately 68 per cent of actual expenditure was for salaries and benefits. In addition, $419,382 was allocated under Section 88.

JOBTRAC, a provincial job-creation program, contributed $0.66 million for more than 7,200 person-days of work in range management projects and $1.31 million for more than 13,000 person days of work in recreation management activities.

These projects' main focus was on range fencing, range seeding and development and maintenance of recreation facilities.

There was additional support for range improvement activities from ranchers and for recreation management through voluntary work on recreation sites and trails.

Effects on clients

The needs and priorities of individuals, regional districts, municipal councils, interest groups (such as the Outdoor Recreation Council of B.C.), industry groups (such as the B.C. Cattlemen's Association and forest licensees), and resource agencies were assessed in resource planning activities.

This interaction responded to diverse concerns and suggestions on forest land-use. Alternative uses were evaluated and allocation, access and resource conflict issues were addressed.

Weed-control efforts were conducted in cooperation with other provincial ministries, regional governments and Indian bands.

The recreation management activity provided the public with opportunities for recreational experiences in provincial forests.

It protects and enhances resource values which are the basis for the province's $2-billion tourist industry, the forest industry,

and the $1-billion recreation sports industry.

It supports the forest industry by enabling timber harvesting in visually sensitive areas through landscape management and by reducing wildfires caused by the dispersed recreational use of provincial forests.

It also facilitates the public's recreational use of the forests through the management of resource-use conflicts and by providing a system of rustic, backcountry sites and trails.

Forecasts

- An anticipated prolonged drought in the Cariboo, Kamloops and Nelson forest regions, which threatens summer water supplies, may cause a 10-to-15-per-cent decline in actual use as ranchers respond to higher costs; to date, high cattle prices have encouraged cattle producers to maintain or increase herd sizes;
- Procedures will be developed to ensure that grazing management issues are addressed by the pre-harvest silviculture prescriptions now being prepared by the forest industry as part of its new responsibilities for basic silviculture;
- A detailed internal review of the range management activity will be conducted in 1988/89 to confirm that its focus is consistent with government and ranching industry priorities;
- Wilderness management will remain a provincial issue; wilderness policy will be developed, wilderness inventory will be improved; and work will be done co-operatively with other groups to plan and manage the wilderness resource;
- The decision to issue more tree farm licences will require a greater planning effort;
- Resource planning will increasingly be used to actively co-ordinate timber, range and recreation resource management and the resource programs of other provincial agencies; and,
- Resolution of local resource development issues will require integrated resource planning and public consultation to respond to public concerns.

Lands Program

Program description and goals

The program manages and allocates Crown land in the most beneficial way to ensure access for industry, commerce, settlement and conservation uses.

The program also reserves Crown land for other agencies carrying out specific responsibilities on Crown land.

The program has four inter-related components:

- Land marketing and administration;
- Land acquisition and exchange;
- Land surveying; and,
- Land registry.

The first component, land marketing and administration, involves services to the public, industry, and government agencies, which require Crown land for development or conservation. It provides:

- Assistance to clients in meeting their requirements for Crown lands;
- Response to direct applications for Crown lands; and,
- The direct sale of surplus Crown lands.

Crown land marketed for new industry, agriculture, economic and settlement activity contributes to economic diversification and regional development.

Crown land disposal for the highest and best use and at a fair return to the Crown is achieved through land capability assessments, independent appraisals and competitive marketing techniques.

Rights to Crown land are provided through lease, license, right-of-way and sale. Land grants are provided for special public purposes.

The program's second component involves land purchase, exchange and disposition for public benefit.

Acquisitions and exchanges are made for a variety of government programs, including:

- Provincial and federal parks;
- Ecological reserves;
- Social housing;
- Historic sites; and,
- Forest roads.

This component's goals are:

- To meet the land needs of client ministries and Crown agencies;
- To obtain suitable land through purchase, land exchange, or gifting agreement;
- To determine market value through independent appraisal; and,
- To carry out related activities in support of these goals.

The program's third component, land surveying, involves the management of all Crown land cadastral surveys within the province. Here the goals include:

- Issuing cadastral survey instructions to B.C. lands surveyors contracted by the ministry;
- Examining survey returns to ensure they conform with the instructions; and,
- Maintaining legal survey standards in the province by drafting and enforcing regulations according to legislation, and providing counsel on issues relating to cadastral surveys to other government ministries, B.C. land surveyors and the public.

The program's fourth component, the maintenance of a registry system that records legal interests on Crown land, includes these goals:

- Providing a complete, official government record of all surface rights over Crown land in the province, other than those associated with mineral rights;
- Developing a state-of-the-art land information system based on the automated Crown land registry information system, and having both textual and graphic capability; and,
- Making information from the Crown land registry information system available to interested public or private agencies.

Client situation

The ministry's clientele can be summarized as follows:

- Industrial/commercial tenure holders — 30 per cent;
- Individuals/families with residential and recreational lot tenures — 25 per cent;
- Corporations/families with agricultural tenures — 10 per cent;
- Local government and community groups — five per cent; and,
- Provincial and federal agencies — 30 per cent.

Activities

Land policy development

- Projects were initiated in three new policy areas:
  - Waterfront land sales;
  - Backcountry recreation; and,
  - Industrial minerals.
- Eight major land policies were streamlined.
- Changes in Crown land pricing were initiated in these areas:
  - B.C. Ferry Corporation;
  - Aquaculture;
  - Log-handling;
  - Linear utilities;
  - Recreational cottages;
  - Removal of rental phase-in; and,
  - *Land Act* fees.
- Land policy interpretation and support were provided to the regional lands offices, especially in the areas of agriculture and aquaculture.
- Two Coastal Resource Identification Studies — on the Western Georgia Strait, the Desolation Sound-Johnstone Strait, and the Sechelt-Sunshine Coast — were completed to guide aquaculture interests in these areas.

Indian lands disputes

The resolution of three Indian cut-off lands disputes — Kincolith, Alexandria and Ulkatcho — was co-ordinated by the ministry.

Research and documentation was provided on Native land claims in support of provincial and federal negotiations.

Land sales

During the year, 415 parcels were sold for a total of $6,540,864.90 and involved 296 sales through applications and 119 sales through the ministry's marketing program (public competition or direct sale). This included the sale of:

- The Sunshine Hills Golf Course in the lower mainland for $1 million; and,
- The Berkley-Carnation lands in North Vancouver for $1.7 million to facilitate a private development of 47 residential sites;

A successful proposal call for a waterfront commercial tourism opportunity at Nelson was also conducted. And negotiations began for the purchase and development of the Tranquille lands in Kamloops.

Crown Land Marketing Catalogue

Two editions of the *Crown Land Marketing Catalogue* were published. It lists over 1,500 properties with a value exceeding $150 million.

An overnight printing procedure was established to provide current catalogue information to the regional lands offices.

Land development

Work was done on several major land-development projects, including:

- Campbell River marina project;
- Port Hardy replot;
- Beaver Lodge at Campbell River;
- Woss community lands;
- Royal Roads near Victoria;

The ministry facilitated these projects:

- The establishment of the Alexander Mackenzie Heritage Trail;
- Construction of a downhill ski facility at Mount Timothy in the Cariboo region;
- Opening of the Mount Layton Hotspring Resort, Lomak Transportation Centre, and Wolf Creek Hatchery;
- Development of private lands on Shuswap Lake through inter-agency co-ordination;
- B.C. Tel Lightguide right-of-way project — a fibre-optic transmission cable to be laid between Burnaby and Jasper — by co-ordinating government agency approvals;
- Expansion of facilities near the Bugaboo Alpine Recreation Area by providing lands for Bugaboo Helicopter Skiing Ltd.;
- Development of sawmill sites near Revelstoke and South of Ymir by providing lands;
- Development of the base area for the Powder King Ski Area, including a residential subdivision, condominium complex, day-lodge and hotel; and,
- Completion of a ski agreement with Ski Smithers for use of Hudson Bay Mountain.

Land acquisitions, transfers and exchanges

The ministry acquired, transferred and exchanged these lands during the fiscal year:

- Three major timberland acquisitions and exchanges with total timber and land values in excess of $22 million;
- 14 properties were acquired for provincial parks, including Botanical Beach on Vancouver Island and Halkett Bay on Gambier Island;
- 21 properties were acquired for the Pacific Rim National Park;
- 39 rights-of-way through 88 private parcels were acquired for B.C. Forest Service roads, including the South Slocan Road and the Homathko right-of-way;

- 280 parcels were transferred from the Agricultural Land Commission to the ministry;
- Seven land exchanges were carried out including a major exchange with B.C. Rail; and,
- The Williams Lake Stampede Grounds was transferred to the City of Williams Lake.

Free grants of Crown land
The ministry issued 99 free Crown land grants to provincial Crown corporations, municipalities and regional districts, railway companies, schools, etc. They involved a total area of 2 437 hectares and have a total estimated value of $31.15 million (Table J-9).

Included in the free Crown land grants were:
- A 1,170-hectare grant to the City of Cranbrook for spray irrigation facilities for treating sewage; and,
- A grant to the Regional District of Central Kootenay for the Doukhobor Historic Village and the West Kootenay National Exhibition Centre.

Land administration
Land administration transactions increased from 7,603 in 1986-87 to 9,313 in 1987-88 (Table J-2). There were 26,945 tenures and reserves in the ministry's portfolio. Table J-3 gives a regional breakdown.

There were 154 conversions to the new agricultural lease program involving 20,621 hectares.

Land Registry
The development of a state-of-the-art Crown land registry information system continued and progress was made toward geo-referencing, official plan automation, automated file index, survey plan index, Crown land registry, and tenure administration system.

Networking with the information systens of other agencies was achieved.

Land surveying
Land survey activities generated the following quantitative results:
- 542 reference maps were automated;
- 892 map sheets were updated;
- 1,168 sets of survey instructions to private surveyors to conduct Crown land surveys were issued;
- 1,327 plans under the *Land Act*, *Land Title Act*, *Mineral Act*, and *Petroleum and Natural Gas Act* were confirmed or approved;
- 65 accretion and natural boundary applications were adjudicated; and,
- 559 Crown grants were conveyed.

A joint presentation of the Land Inventory System to the Corporation of B.C. Land Surveyors was completed.

Regional staff training for the automated systems development and evaluation was coordinated.

Expenditures

Budget allocation was $17.2 million; actual expenditure was $17 million, including employee benefits (Table J-1).

Effects on clients

In providing Crown land to clients for various uses, the program contributes directly to the economic success of their endeavors and their personal enjoyment, and indirectly to all British Columbians who benefit from the spin-off effects.

The ministry continued to improve communication with clients through:
- Client relations workshops;
- Feature client presentations;
- Program information meetings and seminars for client groups;
- Client feedback questionnaires; and,
- Enhancement of client reception and counselling facilities.

The ministry continued to improve service to clients through:
- Continued development of the automated tenure administration system, which permitted better priorizing and tracking of applications;
- Management of the automated land information system and the associated *Crown Land Marketing Catalogue*, which enhanced land marketing; and,
- Work flow studies and team-building activities in each region, which improved the allocation of staff resources, streamlined the application process, and enhanced service to clients.

Forecasts

The trend towards greater confidence in the provincial economy appeared to strengthen during the year, as indicated by an increase in demand for Crown land. This trend is expected to continue in 1988-89, supported by continued promotion of marketing programs.

Administration of Crown land tenure portfolio will continue to be streamlined by the automated systems currently in use and under development.

Increased emphasis will be placed on marketing opportunities on Crown land to promote economic diversification and regional development.

The option to purchase land will be extended to existing leaseholders in selected program areas. New applications in selected programs will be permitted to proceed directly to sale rather than lease tenure.

The ministry will continue to build a comprehensive inventory of lands for marketing in order to respond more effectively to clients' needs.

Excellence in service to the public will continue to be a priority and will be sustained by continuing a client-centred orientation.

Conservation needs will continue to be an important part of the program.

Fire Suppression Program

Program description and goals

The program minimizes damage from wildfires on forest and range lands and is closely linked to, and supported by, the forest protection program.

The program supplies regional helitack crews, rapattack services, air tankers and medium helicopter services and directs costs incurred on forest-fire control activities, such as the hiring of men and equipment, short-term aircraft, and the purchase of fire-fighting materials.

The goal, indicated in the *Five-Year Forest and Range Resource Program, 1987-1992*, is to limit annual area burned to 69 000 hectares and the volume of timber loss to 2.6 million cubic metres. This goal was achieved: area burned was nearly 35 000 hectares and timber loss was about 1.8 million cubic metres.

Client situation

The primary clients are other ministry, provincial and federal government programs. It also serves British Columbians by being principally responsible for forest fire control services.

Activities

Direct fire-fighting
Funds direct expenditures on a fire: fire-fighters' wages, equipment rentals (mainly heavy equipment such as bulldozers), supplies, helitack crews, and rappel crews.

Suppression flying
Funds all fire-suppression aircraft costs: fire-detection flying; fire-support flying (mainly helicopter support); air-tanker availability and flying expenditures; and, helicopter and fixed-wing availability (seasonal and short-term contracts).

Site rehabilitation
Funds the rehabilitation of a fire site and includes slope stabilization through grass seeding, rehabilitation of fire-control lines, repair of fire-control damage to fences, and other small items [costs of preparing and replanting these sites are borne by the silviculture program in subsequent years].

Equipment
Funds the purchase of fire-suppression equipment to maintain existing stock and emergency purchases during the fire season.

Standby and overtime
Funds the standby and overtime costs incurred by government employees when undertaking fire-control activities.

Suppression and safety training
Funds the development, production and delivery of fire suppression and safety training to ministry and industry staff and the public.

Expenditures

Budget allocation was $60 million; actual expenditure was $69.6 million; the program accounted for 13 per cent of the ministry's expenditure.

Effects on clients

The fire season was unusually long, extending late into a dry fall. B.C. experienced a higher-than-average year in total fires — 3,477 fires — but a lower-than-average area was burned. The Kamloops and Cariboo forest regions had the most fire starts, followed by Nelson and Prince George.

Lightning-caused fires accounted for 41 per cent of starts. Total area burned was 34 993 hectares. There were 52 fires which exceeded 100 hectares; the largest was 7 982 hectares.

Forecasts

Regional initial-attack, rapattack and other initial attack forces will remain unchanged.

Specialized 'unit crews' will be introduced to work larger fires more efficiently.

Five medium-lift helitankers will be contracted for the fire season, which, when dispersed throughout the province, will ensure fast initial attack and will reduce the logistic problems of transporting helitack and rapattack crews throughout the province.

Wildland/urban interface fires will become an increasing fact with considerable work being needed to address this growing problem.

Forest Resource Development Agreement

Program description and goals

The Canada-B.C. Forest Resource Development Agreement is a joint initiative of the two levels of government. It recognizes the importance of the forest industry to the social and economic well-being of the province.

The *1984 Forest Resource Analysis* indicated that there were 738 000 hectares of not-satisfactorily-restocked lands on good and medium sites which were not contributing to forest growth.

In addition, there were many established juvenile stands which needed intensive forest management to sustain or improve upon growth and value.

The agreement's objectives are to:

- Manage part of the backlog of not-satisfactorily-restocked lands;
- Intensively manage selected forest stands;
- Support forestry research by government and non-government organizations; and,
- Assist the forest industry through studies related to use, marketing and product development, technology transfer and training.

A major portion of the agreement is implemented by the province through a cost-shared component where the federal government shares the cost on a 50-50 basis.

Also, two unilaterally funded components are administered by the Canadian Forestry Service and the Ministry of Forests and Lands.

This report contains the accomplishments under the cost-shared component and the Ministry of Forests and Lands unilaterally funded component.

Client situation

Reforestation of the not-satisfactorily-restocked lands and intensive forest management of established juvenile stands is important to all British Columbians and the provincial economy.

Without these activities, the economic future for British Columbians would be bleak: unemployment will increase, income generated by the forest industry will decrease, and resource revenues will drop.

Over 90 per cent of the work under the agreement is carried out by private sector contractors.

The program's specific client group, the silviculture contractors, were used to the fullest extent during the year in the many field activities under the program.

Activities

The agreement has three components:

- Backlog reforestation;
- Intensive forest management; and,
- Implementation, communications and evaluation.

Backlog reforestation

This component includes activities to restock the backlog of not-satisfactorily-restocked forest land caused by timber harvests, wildfires and pests, such as surveys, production of seedlings, site preparation, planting, implementation, and extension, demonstration, and research and development.

The accomplishments on Crown lands in 1987-88, relative to goals, were:

Activity	Goals[1]	Accomplishments
	---------- hectares ----------	
Surveys	171 964	203 215
Site rehabilitation	35 848	27 943
Backlog planting	31 433	29 113

1. Revised Goals established by the Canada-B.C. Forest Resource Development Agreement management committee.

During 1987-88:

- About 203 000 hectares of backlog lands were surveyed for stocking, plantability, survival, and stand tending (Table L-2). The survey information is used to develop plans for effective reforestation and stand-improvement projects, to initiate seedling production requests in the reforestation cycle, and to update history records, inventory data bases and forest cover maps — all used for annual reports, timber supply anal-ysis and allowable annual cut projections;

- Site rehabilitation was carried out on about 28 000 hectares, approximately 6 000 hectares short of the goal. However, this is not expected to impact on the ability to meet future planting goals. There is a reduced need for site preparation due to an increase in fill-planting activities as well as due to some areas being available which do not require extensive site preparation;
- About 35 million trees were planted on more than 29 000 hectares (Table L-2), a 42-per-cent increase over 1986-87;
- The cost of producing the seeds and seedlings for planting on backlog lands was approximately $6.3 million.
- Under the Ministry of Forests and Lands unilaterally funded component, expenditures of approximately $4.3 million were directed towards capital projects to improve seed processing facilities and the improvement of nursery facilities for the handling of seedlings. This was necessary to support the reforestation program under the agreement.
- The expanded backlog reforestation effort has increased the need to refine and improve the efficiency of forestry practices essential to the program's success. 'Forestry extension, demonstration, and research and development' is a sub-program of backlog reforestation. In 1987-88, approximately $4.8 million was spent in the improvement of nursery practices, seedling storage and site preparation techniques, reforestation practices and prescriptions, and plantation growth and yield research. Part of these expenditures was for the prompt demonstration and transfer of information, techniques, and standards to the practicing field forester and client organizations. The ministry facilitated the communication of research and development results to practicing field foresters.

Intensive forest management

Activities include brushing, pest control, conifer release, spacing, fertilization and extension, demonstration and research development.

See Table L-2 for a detailed breakdown of regional accomplishments in these activities.

The accomplishments on Crown lands during 1987-88, relative to goals, were:

Activity	Goals[1]	Accomplishments
	---------- hectares ----------	
Brushing	7 285	6 855
Conifer release	2 068	1 254
Juvenile spacing[2]	20 183	21 143
Fertilization	13 547	13 697

Notes:

1. Revised Goals established by the Canada-B.C. Forest Resource Development Agreement management committee.
2. Includes juvenile spacing and sanitation spacing.

During 1987-88:

- Brushing treatments were carried out to control undesirable competing vegetation in backlog stands;
- Pest control projects focussed on major pests that injure young trees;
- Conifer release was carried out to free established conifer trees from competition by cutting growth that is overtopping or surrounding crop trees;
- Selected trees in immature stands were removed (spacing) in order to reduce the density in young stands, to control stocking, encourage growth, prevent stagnation, and improve crop tree value;
- Fertilization was undertaken to correct nutrient deficiencies in forest soils and promote a rapid acceleration in tree growth, resulting in increased volume per tree and a shorter period until harvest.
- The ministry, under the direct funded component, continued funding support for research on the growth-and-yield effects of incremental silviculture treatments.

Implementation and Communication

This component covers the activities required to ensure that the terms and conditions of the agreement are adhered to, that good forestry is being practiced, and that the results of this work are communicated to the general public.

During 1987-88:

- $3 million were spent on the development, supervision, monitoring, and evaluation of projects; and,
- Almost $400,000 was spent on the development and production of general forestry information brochures and slide/tape shows, construction and erection of signs, contracting with professional public relations services and renting or leasing facilities and equipment for presentations.

Expenditures

Budget allocation was $68.8 million; actual expenditure was $66.1 million including employee benefits.

The major portion of this shortfall is attributed to under-expenditure in site rehabilitation and seedling production. Total program expenditure was approximately 50 per cent more than in the previous year.

Expenditures in 1987-88 were:

- $41.8 million under the backlog reforestation program (Table L-1 gives details of costs by forest region);
- $20.7 million under the intensive forest management program.
- $3.5 million under the implementation, communications, and evaluation program; and,
- $0.1 million for employee benefits.

The increase in expenditure from 1986-87 was due to increased goals in all activities for the 1987-88 fiscal year.

Effects on clients

A mid-term (September 30, 1987) assessment of the agreement states that areas already treated are estimated to yield at least 340 000 cubic metres of lumber annually.

This yield represents approximately 1,235 jobs per year or $44.2 million of the Gross Domestic Product annually.

It is expected that over the full term of the agreement, the areas treated will produce more than the orginal projects of 600 000 cubic metres of lumber annually and will result in more than 500 full-time and 15,000 short-term jobs.

During 1987-88 about 230 000 person-days of employment were generated under the program.

Most of the program's work was carried out by private sector contractors and consultants.

Since the program began in May 1985, these accomplishments have been recorded:

- Surveying: 458 000 hectares
- Site rehabilitation: 61 000 hectares
- Planting: 64 000 hectares (78 million trees)
- Brushing: 12 000 hectares
- Conifer release: 1 600 hectares
- Juvenile spacing: 30 000 hectares
- Fertilization: 25 000 hectares
- Jobs generated: 434 000 person-days.

These activities resulted in an increase in productive forest land and improved forest stand values.

The reforestation of the backlog of denuded lands will add to the long-run sustained yield of forest land in the province.

With funding through the agreement, spacing, fertilization, and other stand tending practices will increase the potential yields of second-growth stands, bring them to harvestable size earlier, and thus maintain or increase the allowable annual cut in the province.

This, in turn, will result in increased employment and income generated in the harvesting, manufacturing, and service industries in the province. In addition, increased resource revenues will become available to the province.

Forecasts

The incremental silviculture activities funded under the agreement will continue to be an important part of the silviculture activities on Crown land in 1988-89 and 1989-90.

The province is looking forward to negotiations with the federal government for an extension of the program beyond its expiry date of March 1990.

A new agreement would help to further reduce the remaining backlog of not-satisfactorily-restocked lands in the province, and to increase the value of existing stands.

III. Summary Financial and Statistical Tables

Note: All financial data for 1987-88 contained in Section III are unaudited. Figures in tables may not add to the totals shown due to rounding.

Table 1: Forecast and actual expenditure and full-time equivalents in 1987-88, by program[1 and 2]

Program	Expenditure[3 and 4]		Full-time Equivalents[5]	
	Budget allocation[6]	Actual[7]	Budget allocation	Actual
	$ '000		FTEs	
A. Minister's Office	$210	$187	6.00	4.28
B. Administration and Support Services	56,431	52,749[8]	301.00	266.58
C. Program Administration	37,865	37,477[8]	846.40	811.87
D. Harvesting	83,603	87,386[9]	1,119.20	1082.64
E. Silviculture[10]	168,480	158,910	827.53	738.03
F. Research	9,320	9,570	177.50	164.73
G. Protection	24,501	24,975	330.25	343.82
Integrated Resource Management:				
H. Range Management	4,704	5,704	84.50	82.32
I. Recreation Management	4,072	5,307	60.00	60.28
Planning (funded under Harvesting Program)				
J. Lands[11]	17,180	16,973	376.00	364.85
K. Fire Suppression	60,000	69,608	43.62	45.40
L. Forest Resource Development Agreement	68,818	66,067	-	-
TOTALS	$535,183	$534,913	4,172.00	3,964.80

Notes:

1. Includes $23.919 million in employee benefits distributed among programs.
2. Includes expenditures made by licencees under Section 88 of the *Forest Act* as follows: budget allocation of $105.73 million and actual expenditure of $103.683 million.
3. Includes a reduction of $1.414 million as per Treasury Board directive.
4. Includes a $3.5-million increase approved by Treasury Board to the Small Business Enterprise Account ($2.5 million for the Harvesting Program and $1 million for Administrative and Support Services Program).
5. The concept of full-time equivalent (FTE) is based upon the normal working hours of one full-time employee for a one-year period (e.g.: 1,827 hours) and is used to account for all personnel on a similar basis.
6. The Forest Stand Management Fund budget allocation is not reflected by program (details are footnoted within individual program tables).
7. As detailed accounting for the JobTrac Program of the Forest Stand Management Fund was not available, actual program expenditures were captured by departmental objects of expenditure.
8. Includes a transfer from the Administration and Support Services Program to the program Administration Program for the Industry Development and Marketing Branch ($0.591 million) and grants ($1.789 million).
9. Includes special warrant of $1.2 million for Beban Logging.
10. Includes $13 million appropriated from the Ministry Operations Vote (35) and transferred to the Forest Stand Management Fund, from which $18.795 million was expended during 1987-88. The difference ($5.795 million) reduced the balance of the fund carried forward. The $18.795 million is net of the $3.2 million of expenditures transferred to the Ministry of Social Services ($0.7 million) and to the Ministry of Advanced Education ($2.5 million).
11. Includes expenditures made out of the Crown Land Account as provided by the *Special Appropriations Act*, 1982, as follows: budget allocation of $2.555 million and actual expenditures of $2.335 million.

Table 2: Composition of actual expenditures in 1987-88, by forest region

Region[1]	Salaries and wages	Materials, supplies and expenses[2]	Contracts	Section 88	Totals
			$ '000		
Cariboo	$10,461	$10,525	$12,360	$8,464	$41,810
Kamloops	12,908	15,324	14,609	13,228	56,069
Nelson	12,401	9,878	14,590	10,316	47,185
Prince George	14,838	17,403	23,526	33,930	89,697
Prince Rupert	11,621	9,094	13,218	12,892	46,825
Vancouver	21,846	9,954	20,678	18,145	70,623
Victoria	65,431[3]	84,881[4]	25,684	6,708	182,704
TOTALS	$149,506	$157,059	$124,665	$103,683	$534,913

Notes:
1. The Lands Program (that portion of the former Ministry of Lands, Parks and Housing that was amalgamated with the Ministry of Forests in August 1986) has been allocated on the basis of the forest regions in order to provide information to the reader on a basis consistent with that provided in the other detailed tables of this report, so as to facilitate inter-table comparability. Vancouver and Prince George regions include two lands regions each.
2. Includes $17.401 million paid to the B.C. Buildings Corporation for occupancy charges incurred throughout the province.
3. Includes $23.919 million in employee benefits for employees in all regions.
4. Includes $2.335 million in Crown Land Account expenditures.

Table 3: Forest and range revenues[1] in 1987-88, by forest region

Region	Forest revenue[2]	Range revenue	Totals
		$ '000	
Cariboo	$28,146	$492	$28,638
Kamloops	27,971	488	28,459
Nelson	18,029	112	18,141
Prince George	75,440	195	75,635
Prince Rupert	45,005	43	45,048
Vancouver	236,492	4	236,496
Victoria	1,570	-	1,570
TOTALS	$432,653	$1,334	$433,987

Notes:
1 Forest and range revenues in Tables 3 and D-2 are presented on an accrual basis.
2 After application of $103.6 million in credits under Section 88 of the *Forest Act*.

Table 4: Forest land in B.C. in 1987-88, by forest region[1]

Region	Stocked with mature timber	Stocked with immature timber	NSR[2] and NC Brush[3] Natural stocking expected	Natural stocking doubtful	Totals
			'000 hectares		
Cariboo	3 565	2 217	90	67	5 939
Kamloops	2 373	1 886	126	69	4 454
Nelson	1 390	2 059	82	122	3 653
Prince George	9 596	5 773	1 005	1 064	17 438
Prince Rupert	6 367	2 153	597	301	9 418
Vancouver	3 402	1 457	146	52	5 057
TOTALS	26 693	15 545	2 046	1 675	45 959

Notes:

1. Source: 1987-88 Inventory Branch reports. Includes forest land on which timber harvesting is restricted partly or wholly by factors such as timber quality, accessibility and environmental sensitivity. Excludes:
   (i) Crown forest land in timber licences which are outside tree farm licences,
   (ii) private forest land outside tree farm licences,
   (iii) federal forest land,
   (iv) major and minor parks, and
   (v) non-forest and non-productive forest land.
   Provincial forest and non-forest total, including all ownerships, is 94 767 062 hectares.
2. Not-satisfactorily-restocked. Areas on which forest stands have been disturbed by fire, harvesting or other causes and have not been restocked with sufficient trees of commercial species.
3. Non-commercial brush. Areas that have been invaded and covered by brush.

Table 5: Deletion of land from provincial forests in 1987-88, by forest region

Region	Designated use of land deleted: Agriculture	Industry and transportation	Parks and recreation	Settlement	Other	Totals
			hectares			
Cariboo	536	2	13 126	35	-	13 698
Kamloops	30	14	357	2	-	403
Nelson	220	20	-	64	-	304
Prince George	2 026	38	2 907	20	-	5 011
Prince Rupert	-	7	58 000	20	-	58 027
Vancouver	-	6	-	4	-	10
TOTALS	2 832	86	74 390	145	0	77 453

IV. Detailed Financial and Statistical Tables

NOTE: All financial data for 1987-88 contained in Section IV are unaudited. Figures in tables may not add to the totals shown, due to rounding.

Table A-1: Minister's office expenditures in 1987-88, by major category of expenditure

Minister's office	Salaries and benefits[1]	Operating expenses	Totals
		$ '000	
Ministry of Forests and Lands	$153	$5	$158
TOTALS	$153	$5	$158

Note:
1. Excludes $.029 million in employee benefits, which were also excluded from previous annual reports.

Table B-1: Administration and Support Services Program expenditures in 1987-88[1 and 2]

	Expenditures -$ '000-
Deputy Minister and Executive	$221
Management Services	272
Financial Services	2,796
Relocation	850
Human Resources	1,428
Audit Services	263
Information Systems	14,184
Technical and Administrative Services	29,202
Public Affairs and Library Services	870
Legal Services	86
TOTALS	$50,172

Note:
1. Excludes $2.577 million in employee benefits, which were also excluded from previous annual reports.
2. Excludes $2.38 million transferred from the Administration and Support Services Program to the Program Administration Program for the Industry Development and Marketing Branch and grants.

Table C-1: Program administration expenditures in 1987-88, by forest region[1 and 2]

Region	Management	Finance	Personnel	Systems	Technical and administrative services	Totals
			$ '000			
Cariboo	$1,438	$875	$106	$164	$1,186	$3,769
Kamloops	1,582	1,596	233	32	1,368	4,811
Nelson	1,521	1,275	84	99	1,526	4,505
Prince George	2,219	1,699	92	166	1,219	5,395
Prince Rupert	1,607	1,260	112	106	1,357	4,442
Vancouver	2,455	2,187	112	114	2,538	7,406
Victoria	2,964	-	-	-	-	2,964
TOTALS	$13,786	$8,892	$739	$681	$9,194	$33,292

Note:
1. Excludes $4.185 million in employee benefits, which were also excluded from previous annual reports.
2. Includes $2.38 million transferred from the Administration and Support Services Program to the Program Administration Program for the Industry Development and Marketing Branch and grants.

Table D-1: Harvesting Program expenditures in 1987-88 by forest region[1, 2, 3 and 4]

Region	Planning and inventory	Valuation	Timber management	Engineering and roads	Scaling	Small Business Enterprise Program	Totals
				$ '000			
Cariboo	$692	$574	$1,975	$2,651	$210	$1,924	$8,026
Kamloops	785	629	2,025	2,964	424	2,320	9,147
Nelson	837	358	2,373	3,606	411	1,621	9,206
Prince George	1,170	516	2,528	9,813	606	2,957	17,590
Prince Rupert	857	516	1,743	2,623	499	2,651	8,889
Vancouver	1,594	1,683	4,186	4,170	2,263	3,334	17,230
Victoria	4,309	2,523	1,854	1,016	-	6	9,708
TOTALS	$10,244	$6,799	$16,684	$26,843	$4,413	$14,813	$79,796

Notes:
1. Excludes $6.390 million in employee benefits, which were also excluded from previous annual reports.
2. Includes $19.299 million in expenditures made by licencees under Section 88 of the *Forest Act* as follows: planning and inventory — $1.387 million, and engineering and roads — $17.912 million.
3. Excludes $1.2 million special warrant for Beban Logging.
4. Includes $1.638 million in expenditures from the Forest Stand Management Fund, which is part of the silviculture allocation base.

Table D-2: Forest revenue in 1987-88, by forest region

Region	Annual rents	Stumpage accrued[1] Net stumpage	Plus credits	Gross stumpage	Royalty and export	Scaling	Interest[2]	Other[3]	Totals
	$ '000								
Cariboo	$1,983	$25,658	$8,521	$34,179	-	$267	$120	$118	$36,667
Kamloops	1,935	25,037	15,908	40,945	$2	309	178	510	43,879
Nelson	1,556	15,412	10,446	25,858	468	213	258	112	28,475
Prince George	3,858	69,806	34,715	104,521	-	481	728	567	110,155
Prince Rupert	1,987	41,269	13,393	54,662	2,050	306	(85)	(522)	58,398
Vancouver	7,087	201,408	201,651	222,059	24,211	2,326	818	642	257,143
Victoria	672	-	-	-	-	-	2	896	1,570
TOTALS	$19,078	$378,590	$103,634	$482,224	$26,731	$3,902	$2,019	$2,333	$536,287

Notes:

1. Includes stumpage billed and an estimate of stumpage on timber scaled but not yet billed.
2. Prince Rupert forest region reflects negative interest revenue as a result of Fire Accounts being issued in 1985 with successful dispute of invoices being resolved in clients favor during 1987-88.
3. Includes forest protection agreements and miscellanea. (See #2 above). Cancellation of fire accounts reduced miscellaneous revenue in Prince Rupert to a negative position.

Table D-3: Average stumpage prices[1] in 1987-88, by forest region and species

Region	Balsam		Cedar		Cypress		Douglas-fir	
	Volume	Price	Volume	Price	Volume	Price	Volume	Price
	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)
Cariboo:								
Coast	-	-	-	-	-	-	-	-
Interior	330	5.15	76	2.32	-	-	652	4.42
Kamloops	878	4.76	419	2.93	*	4.33	1 198	3.10
Nelson	569	3.29	414	3.31	-	-	513	3.32
Prince George	1 800	6.71	32	5.88	-	-	251	5.00
Prince Rupert:								
Coast	275	2.50	113	4.89	44	11.72	-	-
Interior	1 269	4.21	118	2.94	-	-	*	3.47
Vancouver:								
Coast	3 428	6.13	4 624	11.56	549	65.83	1 917	9.62
Interior	330	2.51	46	4.72	4	5.79	181	3.21
TOTALS	8 879	5.37	5 842	9.85	597	61.44	4 712	6.06

Region	Hemlock		Larch		Lodgepole Pine		Spruce	
	Volume	Price	Volume	Price	Volume	Price	Volume	Price
	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)
Cariboo:								
Coast	-	-	-	-	-	-	-	-
Interior	20	1.94	-	-	4 612	2.23	1 855	5.51
Kamloops	178	1.64	86	4.17	2 685	3.51	2 127	5.12
Nelson	323	2.18	239	3.75	1 417	3.30	1 332	3.41
Prince George	13	5.02	*	1.08	5 081	3.49	7 126	5.94
Prince Rupert:								
Coast	489	2.46	-	-	6	2.20	178	12.43
Interior	1 584	1.73	-	-	1 983	4.91	1 552	4.56
Vancouver:								
Coast	7 761	6.00	-	-	9	2.85	809	16.16
Interior	141	2.15	-	-	26	2.68	145	3.00
TOTALS	10 509	4.94	325	3.86	15 819	3.28	15 124	5.88

Region	White Pine		Other species		All species	
	Volume	Price	Volume	Price	Volume	Price
	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)
Cariboo:						
Coast	-	-	-	-	-	-
Interior	-	-	5	0.50	7 550	3.11
Kamloops	49	9.95	32	1.52	7 652	4.00
Nelson	106	12.29	21	2.80	4 934	3.47
Prince George	-	-	140	0.50	14 443	5.10
Prince Rupert:						
Coast	*	0.25	1	0.93	1 106	4.69
Interior	-	-	77	0.59	6 583	3.84
Vancouver:						
Coast	21	6.87	42	1.59	19 160	9.86
Interior	9	4.23	1	4.40	883	2.83
TOTALS	185	10.66	319	0.93	62 311	5.89

Notes:
1. Based on gross stumpage received on timber billed from tree farm licences, forest licences, timber sale harvesting licences and timber sale licences. Volume excludes firmwood rejects and waste. Excludes stumpage received from Small Business Enterprise Program sales.
* Indicates volume less than 500 m^3.

Table D-4: Stumpage billed[1] from the Small Business Enterprise Program in 1987-88, by forest region

Regions	Volume billed[2]	Stumpage appraised	Bonus bid[3]	Stumpage billed	Stumpage billed as a per cent of stumpage appraised
	--'000 m^3--	----------	$ '000	----------	----- per cent ----
Cariboo	1 288	1,862	6,223	8,085	434
Kamloops	1 014	1,082	5,412	7,214	400
Nelson	766	1,304	2,611	3,916	300
Prince George	1 354	2,549	11,815	14,364	564
Prince Rupert					
Coast	152	426	593	1 019	239
Interior	1 184	2,157	6,185	8,342	387
Vancouver					
Coast	1 300	5,636	9,870	15,506	275
Interior	158	50	1,668	1,718	3,436
TOTALS	7 216	15,786	44,377	60,163	381

Notes:
1. Stumpage billed during 1987-88 does not include accruals.
2. Excludes firmwood rejects and waste.
3. Bid for timber, in addition to stumpage appraised.

Table D-5: Volume of all products billed[1] in 1987-88, by forest region and land status

Land status	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Totals
				'000 m^3			
Crown land							
Tree farm licence[2]	118	950	1 333	672	1 373	10 498	14 944
Timber sale harvesting licence	-	-	-	1 875	-	-	1 875
Forest licence	6 892	6 196	3 103	11 434	5 586	8 937	42 148
Timber sale licence	1 849	1 529	1 298	1 859	2 106	2 079	10 720
Licence to cut	460	61	83	917	112	79	1 712
Timber licence							
Within tree farm licence	-	-	-	-	12	4 142	4 154
Outside tree farm licence	-	137	114	-	95	2 807	3 153
Woodlot licence	87	72	35	178	38	17	427
Other[3]	166	57	55	178	8	411	875
Sub-Totals	9 572	9 002	6 021	17 113	9 330	28 970	80 008
Private land[4]							
Within tree farm licence	-	-	7	2	-	702	711
Within woodlot licence	-	-	-	-	-	-	-
Outside tree farm licence and woodlot licence	496	840	1 218	1 165	372	3 905	7 996
Sub-Totals	496	840	1 225	1 167	372	4 607	8 707
Federal land and Indian reserves	3	142	14	28	87	63	337
TOTALS	10 071	9 984	7 260	18 308	9 789	33 640	89 052

Notes:
1. Includes firmwood rejects.
2. Includes schedule B lands only.
3. Includes rights-of-way, beachcomb, trespass and miscellanea.
4. All Crown granted lands.

Table D-6: Volume of all products billed,[1 and 2] in 1987-88, by forest region and species

Region	Balsam	Cedar	Cypress	Douglas-fir	Hemlock	Larch	Lodgepole pine	Spruce	White pine	Other species	Total
	'000 m^3										
COAST											
Cariboo (C)	-	-	-	-	-	-	-	-	-	-	0
Prince Rupert (C)	325	173	49	*	593	-	7	212	-	9	1 368
Vancouver (C)	5 523	7 477	953	4 580	12 535	-	13	1 205	48	248	32 582
Sub-totals	5 848	7 650	1 002	4 580	13 128	-	20	1 417	48	257	33 950
INTERIOR											
Cariboo (I)	396	93	-	1 149	22	-	6 039	2 337	*	35	10 071
Kamloops	1 031	601	*	1 924	274	126	3 285	2 501	85	159	9 986
Nelson	688	740	-	980	529	451	1 995	1 630	140	106	7 259
Prince George	2 097	65	-	432	16	*	6 584	8 748	*	365	18 307
Prince Rupert(I)	1 538	169	-	*	1 830	-	2 699	2 040	-	145	8 421
Vancouver (I)	370	62	5	230	205	-	27	147	9	3	1 058
Sub-totals	6 120	1 730	5	4 715	2 876	577	20 629	17 403	234	813	55 102
TOTALS	11 968	9 380	1 007	9 295	16 004	577	20 649	18 820	282	1 070	89 052

Notes:
1. Includes firmwood rejects.
2. Includes all harvesting on Crown, private and federal lands and Indian Reserves.
*Indicates volume less than 500 cubic metres.

Table D-7: Area harvested in 1987-88, by forest region

Region	Type of harvest	Crown land				Private land			
		TFL[1]	TSA[2]	Other3	Sub-total	TFL[4]	Other[5]	Sub-total	Totals
		hectares							
Cariboo	Clear-cut	348	46 572	2 541	49 461	-	1 879	1 879	51 340
	Selective cut	36	6 917	546	7 499	-	-	-	7 499
	Sub-totals	384	53 489	3 087	56 960	-	1 879	1 879	58 839
Kamloops	Clear-cut	7 982	23 883	148	32 013	-	795	795	32 808
	Selective cut	54	7 898	492	8 444	-	688	688	9 132
	Sub-totals	8 036	31 781	640	40 457	-	1 483	1 483	41 940
Nelson	Clear-cut	4 945	15 673	384	21 002	-	2 363	2 363	23 365
	Selective cut	811	5 535	270	6 616	-	1 815	1 815	8 431
	Sub-totals	5 756	21 208	654	27 618	-	4 178	4 178	31 796
Prince George	Clear-cut	3 257	50 422	7 952	61 631	-	4 994	4 994	66 625
	Selective cut	-	-	-	-	-	30	30	30
	Sub-totals	3 257	50 422	7 952	61 631	-	5 024	5 024	66 655
Prince Rupert	Clear-cut	4 085	6 215	260	10 560	-	1 026	1 026	11 586
	Selective cut	-	635	-	635	-	-	-	635
	Sub-totals	4 085	6 850	260	11 195	-	1 026	1 026	12 221
Vancouver	Clear-cut	17 502	20 091	2 276	39 869	3 468	3 641	7 109	46 978
	Selective cut	-	1 026	213	1 239	-	314	314	1 553
	Sub-totals	17 502	21 117	2 489	41 108	3 468	3 955	7 423	48 531
Sub-Totals	Clear-cut	38 119	162 856	13 561	214 536	3 468	14 698	18 166	232 702
	Selective cut	901	22 011	1 521	24 433	-	2 847	2 847	27 280
TOTALS		39 020	184 867	15 082	238 969	3 468	17 545	21 013	259 982

Notes:
1. Includes Crown land within tree farm licences.
2. Includes Crown land within timber supply areas, excluding tree farm licences.
3. Includes Crown land within woodlot licences, farm leases, federal lands and Indian Reserves.
4. Includes private land within tree farm licences.
5. Includes private land outside tree farm licences.

Table D-8: Volume of logs exported from B.C. in 1987-88, by species

Species	Exported under permit[1]	Other exports[2]	Total
	'000 m^3		
Balsam	786	66	852
Cedar	*	*	*
Cypress	5	38	43
Douglas-fir	464	223	687
Hemlock	1,214	133	1,347
Lodgepole pine	43	1	44
Spruce	684	32	716
Other softwood	15	6	21
Cottonwood	77	25	102
Other hardwood	43	35	78
TOTALS	3 331	559	3 890

Notes:
1. Export permit granted under Section 137 of the *Forest Act*. Logs harvested from provincial Crown land, private land within a tree farm licence area, and from private land granted by the Crown after March 12, 1906.
2. No export permit required under the *Forest Act*. Logs harvested from private land that was granted by the Crown prior to March 13, 1906, and is not within a tree farm licence area, and logs harvtested from federal land and Indian reserves.

* Indicates volume less than 500 m^3.

Table D-9: Small Business Enterprise Program in 1987-88, by forest region

	Registrants[1]		Sales		Volume	
Region	Cat. 1[2]	Cat. 2[3]	Cat. 1	Cat. 2	Sold[4]	Value[5]
	number				- '000 m^3 -	- $ '000 -
Cariboo	432	55	241	44	1 459	10,763
Kamloops	560	93	297	43	957	8,312
Nelson	377	106	113	47	872	6,055
Prince George	464	67	97	22	1 329	13,492
Prince Rupert	351	84	206	51	1 355	12,440
Vancouver	877	64	188	11	1,101	25,619
TOTALS	3 061	469	1,142	218	7 073	76,681

Notes:
1. On March 31, 1988.
2. Category 1: Registrants who, at the time of application, did not own a timber processing facility.
3. Category 2: Registrants who, at the time of application, owned a timber processing facility.
4. Tendered volume.
5. Value based upon appraised price at time of sale plus bonus bid, if any.

Table D-10: Number of licences as at March 31, 1988, by forest region

Form of rights to timber	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Total
	number						
Regular licences							
Tree farm licence[1]	1	5	5	2	3	15	31
Woodlot licence	85	70	42	139	32	24	392
Timber sale harvesting licence	-	-	-	1	-	-	1
Forest licence	18	30	27	31	26	55	187
Timber sale licence (major)	11	27	29	19	4	37	127
Timber sale licence (minor), SBEP[2]	184	188	235	173	328	358	1,466
Other[3]	41	76	210	87	75	172	661
Sub-totals	340	396	548	452	468	661	2,865
Special licences							
Forest licence[4,5,6]	9	-	-	1	-	3	13
Timber sale licence[7] (major)	-	-	1	-	2	2	5
Sub-totals	9	-	1	1	2	5	18
TOTALS	349	396	549	453	470	666	2,883

Notes:
1. Tree Farm Licence 25 is in both the Vancouver and Prince Rupert forest regions
2. Small Business Enterprise Program (SBEP): actual number of licences as at March 31, 1987.
3. Licences issued within the Forest Service Reserve. This total includes forest licences in effect on March 31, 1988, and licences for salvage sales, cash sales, free use permits, etc. issued between April 1, 1987, and March 31, 1988.
4. Special Forest Licence in Lot 7741 Military Reserve.
5. For deciduous trees.
6. Special forest licences, e.g., salvage sales in Kalum Timber Supply Area, etc.
7. Special timber sale licences.

Table D-11: Volume committed as at March 31, 1988, by forest region

Form of rights to timber	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Total
	'000 m^3						
Regular licences							
Tree farm licence[1]	110	779	1 530	548	1 232	14 223	18 422
Woodlot licence[2]	78	70	49	134	65	76	472
Timber sale harvesting licence	-	-	-	1 569	-	-	1 569
Forest licence	5 195	6 107	3 730	10 874	6 074	7 896	39 876
Timber sale licence (major)	171	96	141	221	39	205	873
Timber sale licence (minor), SBEP	552	717	445	1 401	1 296	1 035	5 446
Forest service reserve[3]	2 453	306	1 107	71	267	134	4 338
Pulpwood Agreements	-	-	-	452	-	-	452
Sub-totals	8 559	8 075	7 002	15 270	8 973	23 569	71 448
Special licences							
Forest licence[4,5]	532	-	-	171	-	61	764
Timber sale licence (major)	291	-	25	-	345	60	721
Sub-totals	823	-	25	171	345	121	1 485
TOTALS	9 382	8 075	7 027	15 441	9 318	23 690	72 933

Notes:
1. Tree Farm Licence 25 is in both the Vancouver and Prince Rupert forest regions
2. Volume apportioned.
3. Volume apportioned to the forest service reserve. Timber from the reserve is sold under timber sale licences and forest licences and free use permits.
4. Special forest licence in Lot 7741 military reserve.
5. Special forest licences, e.g., salvage.

Table D-12: Road construction, inventory and construction costs in 1987-88, by forest region and road size.

Region	Road size[1]	Construction			Construction cost	
		By licensee[2]	By ministry[3]	Current inventory[4]	By licensee[2]	By ministry[3]
		kilometres			$'000	
Cariboo	Double lane	38	133	632	735	2,075
	Single lane	14	22	3 105	371	236
	Sub-totals	53	155	3 737	1,106	2,311
Kamloops	Double lane	-	-	141	-	-
	Single lane	43	99	7 543	996	1,240
	Sub-totals	43	99	7 684	996	1,240
Nelson	Double lane	-	-	258	-	-
	Single lane	20	63	7 510	806	1,236
	Sub-totals	20	63	7 768	806	1,236
Prince George	Double lane	14	-	2 138	1,056	-
	Single lane	49	170	3 618	2,567	1,699
	Sub-totals	63	170	5 756	3,623	1,699
Prince Rupert	Double lane	-	-	374	-	-
	Single lane	40	90	1 662	732	2,173
	Sub-totals	40	90	2 036	732	2,173
Vancouver	Double lane	-	-	22	-	-
	Single lane	8	28	3 337	368	1,564
	Sub-totals	8	28	3 359	368	1 564
Provincial Sub-totals	Double lane	52	133	3 565	1,791	2,075
	Single lane	174	472	26 775	5,840	8,148
TOTALS		226	605	30 340	7,631	10,223

Notes:

1. Ministry of Forests and Lands road sizes:
   Double lane,
   - Class 1 (10 metres wide)
   - Class 2 (nine metres wide)
   - Class 3 (eight metres wide)

   Single lane,
   - Class 4 (six metres wide)
   - Class 5 (five metres wide)
   - Class 6 (four metres wide)
2. As approved under Section 88 of the *Forest Act*.
3. Includes approval under the Small Business Enterprise Program and the Emergency Bark Beetle Program.
4. March 31, 1988. Includes transfers to and from other government agencies and private ownership, and cancellations.

Table D-13: Road improvement, upgrading and maintenance, with costs, in 1987-88, by forest region and road size

Region	Road size[1]	Improvements/ upgrading[2]		Maintenance[3]	Improvements/ upgrading		Maintenance
		By licensee[4]	By ministry[5]	By ministry[5]	By licensee[2]	By ministry[3]	By ministry
		kilometres			$'000		
Cariboo	Double lane	-	28	100	28	295	70
	Single lane	10	15	902	40	80	364
	Sub-totals	10	43	1,002	68	375	434
Kamloops	Double lane	-	5	55	-	5	4
	Single lane	57	164	44	212	609	297
	Sub-totals	57	169	500	212	614	301
Nelson	Double lane	-	-	-	-	-	-
	Single lane	48	97	668	282	197	365
	Sub-totals	48	97	668	282	197	365
Prince George	Double lane	46	-	62	611	-	38
	Single lane	79	29	383	1,245	346	153
	Sub-totals	125	29	445	1,856	346	191
Prince Rupert	Double lane	-	-	20	-	-	79
	Single lane	18	55	73	490	273	143
	Sub-totals	18	55	93	490	273	222
Vancouver	Double lane	-	-	-	-	-	-
	Single lane	2	178	656	112	734	1,015
	Sub-totals	2	178	656	112	734	1,015
Provincial Sub-totals	Double lane	46	33	237	639	300	191
	Single lane	214	538	3 127	2,381	2,239	2,337
- TOTALS		260	571	3 364	3,020	2,539	2,528

Notes:

1. Ministry of Forests and Lands road sizes:
   Double lane,
   - Class 1 (10 metres wide)
   - Class 2 (nine metres wide)
   - Class 3 (eight metres wide)

   Single lane,
   - Class 4 (six metres wide)
   - Class 5 (five metres wide)
   - Class 6 (four metres wide)
2. Improvement beyond general surface maintenance: all aspects of structural maintenance, including road "reconstruction."
3. Surface maintenance that includes culvert repairs and replacement of small culverts, cleaning of ditches, bank clearing, spot gravelling and surface grading.
4. As approved under Section 88 of the *Forest Act*.
5. Includes approval under the Small Business Enterprise Program and the Emergency Bark Beetle Program.

Table D-14: Bridge and major culvert construction, inventory and costs in 1987-88, by forest region and bridge class

Region	Stucture class[1]	Construction[2]			Construction		
		By licensee[4]	By ministry[5]	Current inventory[5]	By licensee[2]	By ministry[3]	Inspection/ maintenance
		number			$'000		
Cariboo	P	4	5	43	270	235	35
	SP	-	-	31	-	104	-
	T	-	-	92	-	-	-
	MC	2	-	23	103	-	-
	Sub-totals	6	10	189	373	339	35
Kamloops	P	8	8	63	490	245	-
	SP	2	11	46	95	261	1
	T	9	3	380	103	34	21
	MC	1	4	25	16	24	-
	Sub-totals	20	26	514	704	564	22
Nelson	P	4	-	62	461	-	7
	SP	4	11	76	257	266	-
	T	3	11	599	29	73	40
	MC	2	2	109	8	28	-
	Sub-totals	13	24	846	755	367	47
Prince George	P	6	2	151	2,154	179	286
	SP	1	6	63	137	250	40
	T	-	1	128	-	55	17
	MC	6	7	169	230	191	-
	Sub-totals	13	16	511	2,521	675	343
Prince Rupert	P	1	3	44	70	490	-
	SP	-	-	11	-	-	-
	T	-	7	118	-	117	6
	MC	2	-	25	61	-	-
	Sub-totals	3	10	198	131	607	6
Vancouver	P	7	6	64	1,488	330	1
	SP	2	9	85	117	239	2
	T	4	14	414	27	212	32
	MC	-	8	57	-	56	12
	Sub-totals	13	37	620	1,632	837	47
Sub-totals	P	30	24	427	4,933	1,479	329
	SP	9	42	312	606	1,120	43
	T	16	36	1,731	159	491	116
	MC	13	21	408	418	299	12
TOTALS		68	123	2,878	6,116	3,389	500

Notes:

1. Ministry of Forests and Lands' structure classes: **P**: Permanent: Any bridge having all of its major components constructed of steel, concrete, or timber that has been pressure-treated with a suitable preservative; **SP**: Semi-Permanent: Any bridge having a substantial proportion of its components constructed of steel, concrete, or timber that has been pressure-treated with a suitable preservative; **T**: Temporary: Any bridge having most of its components constructed of untreated wood; **MC**: Major Culverts: A minimum diameter of 1 800 mm.
2. Includes replacement structures.
3. As approved under Section 88 of the *Forest Act*.
4. Includes approval under the Small Business Enterprise Program and the Emergency Bark Beetle Program.
5. March 31, 1988. Includes transfers to and from other government agencies and private ownership, deletions and closures.

Table E-1: Silviculture program expenditure in 1987-88, by forest region[1] and [2]

Region	Administration	Basic silviculture	Incremental silviculture	Nursery operations	Seed operations	Small Business Enterprise	Totals
	$ '000						
Cariboo	$1,323	$7,532	$1,462	-	-	$866	$11,183
Kamloops	2,591	12,639	1,464	-	-	910	17,604
Nelson	1,925	10,517	1,409	-	-	796	14,647
Prince George	2,905	26,387	1,753	-	-	2,631	33,676
Prince Rupert	1,927	12,201	1,392	-	-	2,129	17,649
Vancouver	4,220	15,776	4,101	-	-	1,120	25,217
Victoria	3,222	151	697	25,431[3]	4,461	665	34,627
TOTALS	$18,113	$85,203	$12,278	$25,431	$4,461	$9,117	$154,603

Notes:

1. Excludes $4.307 million in employee benefits, which were also excluded from previous annual reports.
2. Includes $82.861 million in expenditures made by licencees under Section 88 of the *Forest Act* as follows:

Activity	Millions
Administration	$1.670
Basic Silviculture	74.482
Incremental Silviculture	0.001
Nursery Operations	4.349
Seed Operations	2.359
TOTAL	$82.861

3. Includes $11.379 million for ministry nurseries and $7.281 million for commercial nurseries, and $4.349 million for licencee Section 88 nurseries.

Table E-2: Surveys[1] undertaken on naturally regenerated stands and on plantations on Crown land in 1987-88, by forest region

Region	Basic silviculture	Incremental silviculture	Totals
	hectares		
Cariboo	21 067	56 261	77 328
Kamloops	79 778	25 257	105 035
Nelson	64 210	26 190	90 400
Prince George	74 752	60 799	135 551
Prince Rupert	67 067	20 623	87 690
Vancouver	79 721	14 085	93 806
TOTALS	386 594	203 215	589 809

Note:
1. Includes site preparation surveys, plantability surveys, stocking surveys, survival surveys, stand tending surveys and free growing surveys. Does not include aerial surveys.

Table E-3: Site preparation for natural restocking on Crown land in 1987-88, by forest region

Treatment	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Totals
	hectares						
Broadcast burned	-	27	714	364	-	230	1 335
Bunched (piled) and burned	62	431	210	88	-	-	791
Spot burned	436	216	87	-	-	38	777
Drag scarified	3 807	1 196	1 344	4 426	11	-	10 784
Blade scarified	-	871	786	7	-	170	1 834
Bunched only	34	1 254	275	59	-	26	1 648
Other mechanical[1]	2 262	147	80	112	-	-	2 601
Chemical only	-	2 250	198	-	-	1	2 449
Residual falling (including snags)	-	-	-	-	-	149	149
Snag falling only	-	-	-	-	-	-	-
Other[2]	100	898	109	-	-	673	1 780
TOTALS	6 701	7 290	3 803	5 056	11	1 287	24 148

Notes:
1. Includes use of a Marden brush chopper, V-plow, and disc trencher.
2. Includes mistletoe control, cabling and knockdown of trees over three metres high.

Table E-4: Site preparation for planting on Crown land in 1987-88, by forest region

Treatment	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Totals
	hectares						
Broadcast burned	5 546	4 427	6 183	40 007	8 894	5 109	70 166
Bunched (piled) and burned	680	2 234	1 289	4 049	141	35	8 428
Spot burned	4 833	2 553	1 095	3 420	1 329	756	13,986
Drag scarified	487	231	209	177	78	12	1 194
Blade scarified	97	563	443	3 182	-	148	4 433
Bunched only	1 099	1 155	557	2 958	1 577	170	7 516
Other mechanical[1]	1 450	606	230	5 527	2 191	609	10 613
Chemical only	4	469	42	985	275	275	2 050
Residual falling (including snags)	-	-	-	-	-	881	881
Snag falling only	-	38	-	-	-	-	38
Other[2]	2 525	1 771	278	401	136	18	5 129
TOTALS	16 721	14 046	10 326	60 706	14 621	8 013	124 434

Notes:
1. Includes use of a Marden brush chopper, Leno scarifier, V-plow, disc trencher, Bracke scarifier, ripper plow, backhoe and Bracke mounder.
2. Includes mistletoe control, cabling and knockdown of trees over three metres high.

Table E-5: Crown land planted in 1987-88, by forest region

Region	Area planted			Trees planted		
	Basic silviculture	Incremental silviculture	Totals	Basic silviculture	Incremental silviculture	Totals
	hectares			'000		
Cariboo	12 285	3 580	15 865	16,008	4,356	20,364
Kamloops	15 293	3 259	18 552	20,087	4,144	24,231
Nelson	11 258	7 255	18 513	17,164	8,070	25,234
Prince George	42 179	11 040	53 219	52,769	14,059	66,828
Prince Rupert	25 519	2 956	28 475	28,392	2,931	31,323
Vancouver	28 396	1 023	29 419	26,726	1,063	27,789
TOTALS	134 931	29 113	164 044	161,145	34,623	195,768

Table E-6: Trees planted[1] on Crown land in 1987-88, by forest region and species

Treatment Totals	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver
			'000			
Cypress	-	-	-	-	377	377
Douglas-fir	3,371	4,187	3,612	-	12,416	23,585
Fir, subalpine	-	-	-	-	-	-
Fir, amabilis	-	-	-	10	938	949
Fir, grand	-	-	-	-	406	406
Hemlock, mountain	-	-	-	-	50	50
Hemlock, western	-	-	-	400	4,170	4,571
Larch, western	-	85	701	8	-	795
Pine, lodgepole	4,919	8,198	9,123	15,972	19,654	-
Pine, western white	-	16	152	87	-	197
Pine, yellow	-	38	92	-	-	23
Redcedar, western	66	118	1,204	1,175	144	5,809
Spruce, Engelmann and white	12,008	11,589	10,350	49,594	10,089	2,255
Spruce, Sitka	-	-	-	-	1,017	1,147
TOTALS	20,364	24,231	25,234	66,828	31,323	27,789

Note:
1. Includes trees for both basic and incremental planting.

Table E-7: Area planted in 1987-1988, by forest region and by responsibility

Region	Crown land				Private land				
	TSA[2]								
	TFL[1]	Licensee[3]	Ministry[4]	Sub-Total	TFL[5]	MFLU[6]	Other[7]	Total	Sub-Totals
	hectares								
Cariboo	556	10 897	4 412	15 865	53	-	-	53	15 918
Kamloops	2 611	11 129	4 812	18 552	-	-	-	-	18 552
Nelson	2 062	6 027	10 424	18 513	-	-	-	-	18 513
Prince George	2 115	34 681	16 423	53 219	-	-	-	-	53 219
Prince Rupert	2 225	19 270	6 980	28 475	-	-	-	-	28 475
Vancouver	15 310	10 825	3 284	29 419	1 019	3 426	460	4 905	34 325
TOTALS	24 880	92 829	46 335	164 044	1 072	3 426	460	4 958	169 002

Notes:
1. Includes Crown land within tree farm licences. Planting is funded by the ministry,through credits against stumpage payable. Planting is the responsibility of the licensee.
2. Includes Crown Land within timber supply areas, excluding tree farm licences, woodlot licences, farm leases, federal lands and Indian Reserves.
3. Planting is funded by the ministry, through credits against stumpage payable. Planting is the responsibility of the licensee.
4. Planting is funded by the ministry and Canada-B.C. Forest Resource Development Agreement. Planting is the responsibility of the ministry.
5. Includes private land within tree farm licences.
6. Includes private land within managed forest land units, but outside tree farm licences.
7. Includes private land outside tree farm licences and managed forest land units.

Table E-8: Trees planted in 1987-88, by forest region and by responsibility

	Crown land				Private land				
		TSA[2]							
Region	TFL[1]	Licensee[3]	Ministry[4]	Sub-Total	TFL[5]	MFLU[6]	Other[7]	Sub-Total	Totals
	'000								
Cariboo	777	14,014	5,573	20,364	92	-	-	92	20,455
Kamloops	3,573	14,486	6,172	24,231	-	-	-	-	24,231
Nelson	2,530	10,437	12,267	25,234	-	-	-	-	25,234
Prince George	2,116	43,094	21,618	66,828	-	-	-	-	66,828
Prince Rupert	1,971	21,677	7,675	31,323	-	-	-	-	31,323
Vancouver	12,161	11,294	4,334	27,789	902	2,880	366	4,149	31,937
TOTALS	23,128	115,002	57,639	195,768	994	2,880	366	4,240	200,009

Notes:
1. Includes Crown land within tree farm licences. Planting is funded by the ministry, through credits against stumpage payable. Planting is the responsibility of the licensee.
2. Includes Crown Land within timber supply areas, excluding tree farm licences, woodlot licences, farm leases, federal lands and Indian Reserves.
3. Planting is funded by the ministry, through credits against stumpage payable. Planting is the responsibility of the licensee.
4. Planting is funded by the ministry and Canada-B.C. Forest Resource Development Agreement. Planting is the responsibility of the ministry.
5. Includes private land within tree farm licences.
6. Includes private land within managed forest land units, but outside tree farm licences.
7. Includes private land outside tree farm licences and managed forest land units.

Table E-9: Brushing on Crown land in 1987-88, by forest region

Funding source	Region	Treatment		
		Manual	Chemical	Totals
		---------- hectares ----------		
Ministry[1]	Cariboo	-	309	309
	Kamloops	733	826	1 559
	Nelson	313	75	388
	Prince George	674	6 723	7 397
	Prince Rupert	1 165	4 140	5 305
	Vancouver	1 103	8 703	9 806
	Sub-totals	3 988	20 776	24 763
Forest Stand Management Fund[2]	Cariboo	19	-	19
	Kamloops	207	29	236
	Nelson	159	-	159
	Prince George	695	-	695
	Prince Rupert	525	-	525
	Vancouver	933	1 017	1 950
	Sub-totals	2 538	1 046	3 584
Federal programs[3]	Cariboo	-	-	-
	Kamloops	-	-	-
	Nelson	-	-	-
	Prince George	11	41	52
	Prince Rupert	43	-	43
	Vancouver	694	132	826
	Sub-totals	748	173	921
Sub-totals	Cariboo	19	309	328
	Kamloops	940	855	1 795
	Nelson	472	75	547
	Prince George	1 380	6 764	8 144
	Prince Rupert	1 733	4 140	5 873
	Vancouver	2 730	9 852	12 582
Totals		7 274	21 995	29 269

Notes:
1. Includes ministry expenditure under regular vote and Small Business Enterprise Program, Section 88 credits against stumpage payable and funds from the Canada-B.C. Forest Resource Development Agreement.
2. Includes accomplishments under JOBTRAC.
3. Includes accomplishments under the Canada Job Strategy Program.

Table E-10: Crown land improved in 1987-88, by forest region

Funding source	Region	Spacing[4]	Fertilization	Site rehab.	Conifer release	Commercial thinning	Other[5]
		hectares					
Ministry[1]	Cariboo	4 712	1 443	2 674	248	-	779
	Kamloops	2 351	1 127	1 305	117	-	357
	Nelson	2 365	1 838	3 560	67	-	996
	Prince George	2 979	2 485	15 775	472	99	5 131
	Prince Rupert	4 376	1 652	4 090	127	20	1 073
	Vancouver	5 693	5 191	980	342	58	2 192
	Sub-totals	22 476	13 735	28 384	1 373	177	10 527
Forest Stand Management fund[2]	Cariboo	1 753	-	-	489	-	557
	Kamloops	805	-	-	153	-	242
	Nelson	477	-	-	48	-	190
	Prince George	834	-	-	171	-	1 529
	Prince Rupert	227	-	-	6	-	218
	Vancouver	3 309	-	42	173	-	464
	Sub-totals	7 405	-	42	1 040	-	3 200
Federal programs[3]	Cariboo	175	-	-	-	-	91
	Kamloops	1 225	-	-	22	-	-
	Nelson	-	-	-	-	-	32
	Prince George	494	-	-	169	16	52
	Prince Rupert	184	-	3	-	-	49
	Vancouver	325	-	13	10	-	224
	Sub-totals	2 403	-	16	201	16	448
Sub-totals	Cariboo	6 640	1 443	2 674	737	-	1 427
	Kamloops	4 381	1 127	1 305	292	-	599
	Nelson	2 842	1 838	3 560	115	-	1 218
	Prince George	4 307	2 485	15 775	812	115	6 712
	Prince Rupert	4 787	1 652	4 093	133	20	1 340
	Vancouver	9 327	5 191	1 035	525	58	2 880
TOTALS		32 284	13 736	28 442	2 614	193	14 175

Notes:
1. Includes ministry expenditures under regular vote, Section 88 credits against stumpage payable, and funds from the Canada-B.C. Forest Resource Development Agreement.
2. Includes accomplishments under JOBTRAC and the Vancouver Island Mayor's Proposal.
3. Includes accomplishments under the Canada Job Strategy Program.
4. Includes juvenile spacing and sanitation spacing.
5. Includes pruning, mistletoe control and falling snags and residual trees.

Table E-11: Average cost[1] of silviculture treatments on Crown land in 1987-88, by forest region

Treatment	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Totals
	$/hectare						
Basic silviculture							
Surveys[2]	6	6	5	8	8	11	7
Site preparation for natural restocking	88	98	210	179	134	1,449[3]	145
Site preparation for planting	112	162	318	294	136	532	241
Planting[4]	388	422	548	361	331	428	387
Brushing							
Manual	-	491	401	548	475	487	489
Chemical[5]	213	445	508[6]	208	263	400	296
Incremental silviculture							
Surveys[2]	12	9	6	9	10	15	10
Backlog planting[4]	431	370	535	378	334	444	421
Spacing[7]	453	590	621	459	739	800	619
Fertilization	166	157	172	175	157	173	169
Site rehabilitation	194	292	261	254	285	318	258
Conifer release	87	278	380	546	841	582	451
Commercial thinning	-	-	-	502	-	294	425

Notes:
1. Based on on-site operating cost (equipment, transportation and wages for crew and crew boss).
2. Includes surveys for assessing site treatment, plantation survival and stocking.
3. Above average costs are due to remoteness of activity location.
4. Excludes cost of seedlings
5. Includes cost of herbicides.
6. Due to the small program size (often only operational trials), these are not considered operational costs.
7. Includes juvenile spacing and sanitation spacing.

Table E-12: Seed additions, withdrawals and inventory in 1987-88, by species[1]

Species	Additions		Withdrawals			
	Natural collections	Seed orchard collections	Ministry nurseries[2]	Private and licensee nurseries[2]	Other[3]	Final inventory[4]
	kilograms					
Cypress	0.3	-	-	4.7	1.2	47.3
Douglas-fir	849.9	223.0	189.9	469.3	71.3	10 282.8
Fir, subalpine		-	80.8	8.3	7.5	839.0
Fir, amabilis	256.8	-	327.1	299.9	12.3	3 953.5
Fir, grand	101.5	-	15.3	17.7	218.3	800.0
Hemlock, mountain	-	-	0.6	0.4	-	142.7
Hemlock, western	1.9	11.7	2.2	34.4	43.2	671.0
Larch, western	111.5	-	9.5	2.0	0.2	301.0
Pine, lodgepole	880.0	9.3	336.5	306.8	45.6	4 985.5
Pine, ponderosa	36.3	-	15.5	15.5	5.7	576.2
Spruce, Engelmann	94.1	-	60.7	174.4	25.1	6 282.3
Spruce, Sitka	-	5.2	6.4	7.2	244	689.1
Spruce, white	-	-	115.6	192.1	7.1	4 846.0
Spruce, hybrids[5]	9.6	79.9	113.6	238.1	76.3	7,213.0
Redcedar, western	0.1	0.2	11.5	29.6	103.1	506.5
Miscellanea	-	-	26.7	2.4	4.6	185.4
TOTALS	2 342.0	329.3	1 311.9	1 802.8	865.5	42 321.3

Notes:
1. Excludes approximately 100 kilograms from exotic species.
2. For sowing of seedlings primarily in 1988-89.
3. For direct seeding, export, etc.
4. Anticipated final inventory upon completion of the 1988 spring sowing.
5. Includes natural crosses between Sitka, Engelmann, white and black spruce.

Table E-13: Stock shipment for planting -- summary for 1987-88, by nursery of origin and forest region of destination

Treatment	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Totals
	---------- '000 trees ----------						
MINISTRY							
Chilliwack	-	18	625	352	4,227	607	5,828
Campbell River	-	480	-	2,356	1,157	5,322	9,314
Green Timbers	82	219	1,883	4,896	1,612	97	8,788
Harrop	-	-	5,588	-	-	-	5,588
Koksilah	1,780	90	159	1,638	2,546	4,190	10,403
Red Rock	1,022	367	425	8,975	5,623	-	16,412
Skimikin	5	5,534	3,678	254	-	10	9,481
Surrey	3,208	1,506	805	9,187	3,652	1,747	20,104
Thornhill	-	-	-	2,092	8,371	-	10,463
Telkwa	-	-	-	-	195	-	195
Vernon	201	1,270	1,334	299	-	-	3,104
Sub-totals	6,298	9,482	14,497	30,049	27,381	11,972	99,679
PRIVATE							
Arbutus Grove Nursery Ltd.	420	-	-	526	355	2,469	3,770
Balco Industries Ltd.	-	1,478	-	2,550	-	-	4,028
C.I.P. Inc.	-	-	-	10	-	1,104	1,114
Crown Forest Ltd.	-	2,866	544	8	-	-	3,417
Daveron Ltd.	773	2,781	-	1,923	-	-	5,477
Hammer Ltd.	-	-	-	-	-	1,013	1,013
Hi-Grove Silviculture Ltd.	2,558	-	-	10	-	-	2,568
Hybrid Nurseries Ltd.	200	35	1,118	2,303	-	-	3,657
Industrial Forestry Ltd.	48	-	-	10,441	-	-	10,489
K and C Silviculture Ltd.	158	2,528	3,626	1,918	-	-	8,229
Malaspina College	-	-	-	102	-	-	102
MacMillan Bloedel Ltd.	-	-	-	-	-	1,314	1,314
Mesachie Lake	-	-	-	-	-	139	139
Northwood P. and P. Ltd.	-	-	-	4,125	1,712	-	5,837
Pelton Reforestation Ltd.	4,535	792	2,625	8,743	97	6,452	23,244
Reid Collins Nurseries Ltd.	2,355	824	1,883	1,292	-	1,001	7,354
Ruff's Greenhouses	964	-	-	1,606	-	-	2,571
Summit Nursery Ltd.-		-	-	1,022	3,173	-	4,196
Sylvan Vale Nursery Ltd.	-	-	-	1,033	55	1,189	2,277
University of B.C.	505	133	135	328	-	180	1,281
Valentine Farm	-	-	-	-	-	337	337
Weyerhaeuser Canada Ltd.	-	4,651	66	-	-	-	4,717
Woodmere Nursery Ltd.	-	-	-	785	3,456	-	4,241
Sub-totals	12,515	16,089	9,997	38,724	8,848	15,196	101,370
TOTALS	18,813	25,571	24,494	68,773	36,229	27,168	201,049

Note:

The trees are shipped for planting for both basic and incremental silviculture on Crown land. The number of trees shipped by nurseries may not match the number of trees planted in forest regions due to: stock mortality in storage and transit, stock deterioration and authorized destruction and transfer of stock to another forest region after receipt from originating nursery. Nurseries which had no shipments during the year are not listed.

Table F-1: Research Program expenditures in 1987-88, by forest region [1, 2 and 3]

Region	Support	Forest renewal	Integrated resource management	Forest productivity and decision aids	Regional forest sciences	Totals
			$ '000			
Cariboo	-	$52	$29	-	$240	$321
Kamloops	-	34	81	-	248	363
Nelson	-	119	272	-	25	416
Prince George	-	48	131	-	445	624
Prince Rupert	-	23	-	-	619	642
Vancouver	-	35	57	-	894	986
Victoria	$2,169	1,774	878	$388	-	5,209
TOTALS	$2,169	$2,085	$1,448	$388	$2,471	$8,561

Notes:
1. Excludes $1.009 million in employee benefits, which were also excluded from previous annual reports.
2. Includes $0.765 million in expenditures made by licencees under Section 88 of the *Forest Act*.
3. Includes $0.164 million in JOBTRAC expenditures from the Forest Stand Management Fund, which is part of the Silviculture allocation base.

Table G-I: Protection Program expenditure in 1986-87, by forest region[1, 2 and 3]

Region	Administration	Fire management	Pest management	Air operations	Planning development and research	Emergency bark beetle program	Small Business Enterprise	Totals
	$ '000							
Cariboo	$443	$825	$389	$119	-	$1,844	$6	$3,626
Kamloops	1,175	429	253	132	$40	2,925	13	4,967
Nelson	597	867	334	103	7	929	26	2,863
Prince George	771	959	220	142	-	1,331	14	3,437
Prince Rupert	856	958	273	106	19	1,413	6	3,631
Vancouver	732	795	277	151	-	11	13	1,979
Victoria	357	555	340	120	311	755	-	2,438
TOTALS	$4,931	$5,388	$2,086	$873	$377	$9,208	$78	$22,941

Notes:

1. Excludes $2.034 million in employee benefits, which were also excluded from previous annual reports.
2. Includes $0.338 million in expenditures made by licencees under Section 88 of the *Forest Act* as follows: fire management -- $0.182 million; and pest management -- $0.156 million.
3. Includes $0.660 million in expenditures fom the Forest Stand Management Fund, which is part of the Silviculture allocation base.

Table G-2: Number and causes of wildfires in 1987-88, by forest region

Cause	Cariboo		Kamloops		Nelson		Prince George		Prince Rupert		Vancouver		Totals	
	1987-1988	10-year average	1987-1988	10-year average	1987-1988	10-year average	1987-1988	10-year average	1987-1988	10-year average	1987-1988	10-year average	1987-1988	10-year average
	number of wildfires													
Lightning	229	136	367	359	339	356	272	290	63	75	168	104	1,438	1,320
Recreation[1]	39	19	95	54	48	31	41	29	17	25	69	48	309	206
Railroads	3	4	31	29	7	12	5	9	1	2	11	13	58	69
Smokers	54	30	105	67	60	38	25	21	9	19	54	55	307	230
Brush burning[2]	39	21	62	25	13	13	56	34	22	19	38	18	230	130
Range burning	56	27	10	6	1	1	14	13	-	1	-	-	81	48
Construction[3]	1	2	3	2	-	3	3	4	4	3	4	5	15	19
Industrial[4]	53	24	92	44	79	34	91	37	42	25	85	48	442	212
Incendiary	105	84	39	28	6	9	28	32	6	12	15	9	199	174
Miscellaneous known causes	84	53	139	81	45	41	22	21	43	37	37	30	370	263
Unknown causes	4	1	8	2	4	1	3	1	3	1	6	1	28	7
TOTALS	667	401	951	697	602	539	560	491	210	219	487	331	3,477	2,678

Notes:
1. Campers, hunters, fishermen, etc.
2. Excluding railway or right-of-way clearing.
3. Road, power, telephone, pipeline, and right-of-way construction.
4. Logging, mining and other industries.

Table G-3: Area burned by wildfires in 1987-88, by forest region

Region	Merchantable timber		Immature timber		Other cover[1]		Totals	
	1987-1988	10-year average	1987-1988	10-year average	1987-1988	10-year average	1987-1988	10-year average
	hectares							
Cariboo	2 615	1 516	1 760	659	2 105	926	6 480	3 101
Kamloops	1 333	1 154	1 456	539	2 707	1 008	5 496	2 701
Nelson	923	4 015	215	1 687	821	1 661	1 959	7 363
Prince George	8 469	15 816	3 817	8 463	5 047	22 545	17 333	46 824
Prince Rupert	370	18 779	200	9 512	380	5 965	950	34 256
Vancouver	511	1 145	640	444	481	657	1 632	2 246
TOTALS	14 221	42 425	8 080	21 304	11 541	32 762	33 850	96 491

Note:
1. Includes wildfires on not-satisfactorily-restocked forest land, non-commercial forest land, grazing land, and non-productive sites. Include wildfires less than four hectares in area.

Table G-4: Timber burned by wildfires[1] in 1987-88, by forest region

Region Totals	Merchantable timber	Immature timber[2]	
	'000 m^3		
Cariboo	705.3	100.4	805.7
Kamloops	215.8	67.2	283.0
Nelson	197.7	15.2	212.9
Prince George	1 901.2	269.0	2 170.2
Prince Rupert	99.6	6.2	105.8
Vancouver	167.5	109.3	276.8
TOTALS	3 287.1	567.3	1 854.4

Notes:
1. RAP report by region before salvage. Burned timber is salved wherever practical.
2. Estimates. Based on species and generalized information on age and site. *Assumes complete mortality.*

Table G-5: Area under attack by forest pests[1] in 1987-88, by forest region

Region	Bark beetles[2]	Defoliators	Totals[3]
	hectares		
Cariboo	3 900	20 250	24 150
Kamloops	21 900	839 550	861 450
Nelson	23 100	12 725	35 825
Prince George	4 300	79 400	83 700
Prince Rupert	18 600	-	18 600
Vancouver	1 470	17 100	18 570
TOTALS	73 270	969 025	1 042 245

Notes:
1. Best available estimates of current annual losses. Accuracy varies, depending on pest.
2. Area of forests killed by bark beetles is estimated from aerial surveys in 1987. Represents trees killed in 1986.
3. Many more pests are endemic throughout most forests. Estimates of area under attack are meaningless for these pests without detailed measures of the intensity of infestation.

Table G-6: Timber damaged by forest pests[1] in 1987-88, by forest region

Region	Bark beetles	Defoliators	Dwarf mistletoes	Root diseases	Totals[2]
	'000 m^3				
Cariboo	105	87	350	221	763
Kamloops	852	3 610	260	224	4 946
Nelson	444	55	98	58	655
Prince George	132	341	262	529	1 264
Prince Rupert	1495	-	315	73	1 883
Vancouver	39	74	355	262	730
TOTALS	3 067	4 167	1 640	1 367	10 241

Notes:
1. Best available estimates of current annual losses occuring on the net land base. Accuracy varies, depending on the pest. Only the major forest pests of B.C. are included. Volumes are estimated before salvage. Attacked timber is salvaged wherever practical.
2. Volume lost to decay in forests exceeding 100 years of age is not included. This is estimated at 10 million cubic metres per year. Nursery and regeneration losses and growth losses due to other insects, diseases and unwanted vegetation are also not included.

Table H-1: Range Management Program expenditure in 1987-88, by forest region[1 and 2]

Region	Planning and administration	Improvements: Repair and maintenance	Improvements: Development	Inventory and research	Totals
	$ '000				
Cariboo	$650	$131	$317	$6	$1,104
Kamloops	683	221	236	-	1,140
Nelson	487	62	105	5	659
Prince George	520	66	101	-	687
Prince Rupert	337	46	46	-	429
Vancouver	2	71	70	-	143
Victoria	877	171	23	7	1,078
TOTALS	$3,556	$768	$898	$18	$5,240

Note:
1. Excludes $.464 million in employee benefits, which were also excluded in previous annual reports.
2. Includes $0.655 million in JOBTRAC expenditures from the Forest Stand Management Fund, which is part of the silviculture allocation base.

Table H-2: Grazing permits and grazing licences in 1987-88, by forest region

Region	Permits: Number	Permits: Authorized	Permits: Used	Licences: Number	Licences: Authorized	Licences: Used
		AUM[1]			AUM	
Cariboo	544	264,480	227,630	124	109,201	98,051
Kamloops	389	188,200	170,703	127	164,058	160,152
Nelson	228	72,346	66,342	23	9,176	7,870
Prince George	422	109,212	99,055	65	32,057	29,086
Prince Rupert	176	24,467	19,596	25	9,886	8,608
Vancouver	24	4,126	1,975	3	495	439
TOTALS	1,783	662,831	585,301	367	324,873	304,206

Note:
1. AMU or Animal Unit Month is the amount of forage required for one month by an average animal of the genus bos, aged six months or older.

Table H-3: Hay cutting permits and hay cutting licences in 1987-88, by forest region

Region	Permits			Licences		
	Number	Authorized	Used	Number	Authorized	Used
		tonnes			tonnes	
Cariboo	42	666	566	80	1 602	1 403
Kamloops	-	-	-	3	106	106
Nelson	-	-	-	2	35	5
Prince George	13	252	237	5	83	20
Prince Rupert	2	14	14	6	142	67
Vancouver	1	8	8	-	-	-
TOTALS	58	666	566	96	1 602	1 403

Table H-4: Range improvements[1] on Crown land in 1987-88, by forest region

Region	Seeding		Fencing[3]	Weed control[4]	Water development[5]	Other[6]
	Grassland rehabilitation	Disturbed forest land[2]				
	hectares		(kilometres)	hectares		(numbers)
Cariboo	60	1 546	135	64	83	258
Kamloops	135	5 656	66	728	18	44
Nelson	17	1 538	85	221	68	39
Prince George	1 805	252	33	58	8	7
Prince Rupert	30	689	18	-	-	7
Vancouver	-	20	30	1	-	1
TOTALS	2 047	9 701	367	1 072	177	356

Notes:
1. Excludes improvements funded by the Forestry Social Assistance Recipient Program and wholly by private sources.
2. Includes seeding of clearcuts.
3. Includes repair, maintenance and construction of fences.
4. Control of knapweed, thistle, etc.
5. Includes repair, maintenance and development of water sources.
6. Includes repair, maintenance and development of trails, corrals, cattleguards, etc.

Table H-5: Average cost[1] of range improvements[2] on Crown land in 1987-88, by forest region

Region	Seeding[3]		Fencing[4]		Weed control[5]	
	Total activity	By ministry	Total activity	By ministry	Total activity	By ministry
	---------- $/ha) ----------		---------- $/km ----------		---------- $/ha ----------	
Cariboo	$65	$50	$2,333	$1,378	$587	$587
Kamloops	22	18	2,916	1,116	243	243
Nelson	21	21	2,740	1,540	236	236
Prince George	218	33	1,764	1,849	478	478
Prince Rupert	32	18	2,510	1,168	-	-
Vancouver	90	90	14,000	-	400	200
B.C. $75	$38		$4,377	$1,410	$389	$349

Notes:
1. Based on funds from the Range Management Program, other ministry programs and other sources (on cost-sharing projects).
2. Excludes improvements funded by forestry Jobtrac Program and exclusively by other non-ministry sources.
3. Combines grassland rehabilitation and seeding of disturbed forest land, mainly clearcuts.
4. Construction of new fences.
5. Includes containment of knapweed, thistle and other weeds.

Table I-1 Recreation management program expenditure in 1987-88, by forest region[1, 2 and 3]

Regions	Resource Management	Site and Trail Maintenance	Site and Trail Development	Totals
	---------- $ '000 ----------			
Cariboo	$263	$257	$145	$665
Kamloops	451	252	136	839
Nelson	407	194	94	695
Prince George	409	242	149	800
Prince Rupert	343	168	127	638
Vancouver	361	476	246	1,083
Victoria	126	47	47	220
TOTALS	$2,360	$1,636	$944	$4,940

Notes:
1. Excludes $0.367 million in employee benefits, which were also excluded from previous annual reports.
2. Includes $0.419 million in expenditures made by licencees under Section 88 of the *Forest Act* as follows: site and trail maintenance — $0.167 million; and site and trail development — $0.252 million.
3. Includes $1.312 million in JOBTRAC expenditures from the Forest Stand Management Fund, which is part of the silviculture allocation base.

Table I-2: Recreation site and trail use in 1987-88, by forest region

Region	Sites		Trails	
	Maintained	User visits[1]	Length maintained	User visits[2]
	number		kilometres	number
Cariboo	131	275,000	539	17,000
Kamloops	368	443,000	1 898	140,000
Nelson	244	185,000	1 981	72,000
Prince George	205	144,000	2 419	45,000
Prince Rupert	80	67,000	465	20,000
Vancouver	152	388,000	693	115,000
TOTALS	1,180	1,502,000	7 995	409,000

Notes:
1. Estimates. Based on field surveys.
2. Estimates.

Table J-1: Lands program expenditures in 1987-88, by forest region[1]

Regions[2]	Land marketing and administration	Land acquisition and exchange	Land surveying	Crown land account[3]	Totals
	$ '000				
Cariboo	$854	-	-	-	$854
Kamloops	928	-		-	928
Nelson	739	-	-	-	739
Prince George	1,681	-	-	-	1,681
Prince Rupert	852	-	-	-	852
Vancouver	2,047	-	-	-	2,047
Victoria	1,216	$1,075	$3,198	$2,335	7,824
TOTALS	$8,317	$1,075	$3,198	$2,335	$14,925

Notes:
1. Excludes $2.048 million in employee benefits.
2. The Lands Program (that portion of the former Ministry of Lands, Parks and Housing that was amalgamated with the Ministry of Forests in August 1986) has been allocated on the basis of forest region to provide information to the reader on a basis consistent with that provided in the other detailed tables of this report so as to facilitate inter-table comparability. Vancouver and Prince George regions include two lands regions each.
3. Excludes expenditure and asset portions related to programs administered by the Ministry of Social Services and Housing and the Ministry of Environment and Parks amounting to $64.423 million.

Table J-2: Crown land dispositions and administration in 1987-88

Summary of all regions	Crown land dispositions		Crown land administration
	Dispositions	Total area	Transactions[1]
	-- number --	- hectares -	- number -
Upland			
Agriculture	296	23 987.5	1,398
Aguaculture	4	10.6	1
Industrial	654	5 299.2	555
Commercial	179	519.2	358
Residential	272	11 268.7	868
Recreational	90	53.4	1,707
Community	39	160.6	85
Institutional	156	1 599.5	191
Quarrying	85	3 507.5	140
Transportation	115	1 445.2	87
Communication	98	72.8	136
Special Purpose	22	5 923.7	52
Sub-totals	2,010	53 847.9	5,578
Aquatic Lands			
Aquaculture	352	3 286.4	340
Industrial	108	1 133.9	381
Commercial	75	51.6	373
Residential	78	1 696.3	134
Recreational	40	4.8	60
Community	5	32.7	11
Institutional	46	421.8	73
Quarrying	9	15.3	12
Transportation	11	2.6	6
Communication	2	79.8	8
Special Purpose	14	712.0	7
Sub-totals	740	7 437.2	1,405
Reserves	735	323 061.7	2,330
TOTALS	3,485	384 346.8	9,313

Note:
1. Transactions refer to review or replacement of existing tenures.

Table J-3: Tenure and reserve portfolio as of March 31, 1988, by lands region

*Program	Vancouver Island	Lower Mainland	Thompson-Okanagan	Kootenay	Cariboo	Skeena	Omineca	Peace	Totals
	number								
Upland									
Agriculture:									
Extensive	1	8	44	20	397	117	469	485	1,541
Intensive	1	4	27	6	8	10	2	3	61
Grazing	3	7	271	19	383	87	27	66	863
Aquaculture	4	4	-	-	-	-	-	-	4
Industrial	85	207	388	248	78	159	121	1,677	2,878
Commercial	80	101	164	130	106	147	139	75	862
Residential	76	45	465	146	838	212	276	15	2,073
Recreational	230	891	1,129	342	1,139	422	556	88	4,797
Community	39	39	84	53	62	27	41	19	364
Institutional	207	175	226	97	78	125	64	67	1,039
Quarrying	71	150	317	235	292	260	310	268	1,903
Transportation	31	55	51	78	86	66	50	57	474
Communication sites	61	90	176	165	91	109	74	84	850
Miscellaneous	320	453	654	628	818	651	244	338	4,106
Sub-totals	1,209	2,229	3,996	2,167	4,376	2,392	2,373	3,242	21,984
Aquatic lands									
Aquaculture	554	212	-	-	2	29	-	-	797
Industrial	467	461	106	95	52	162	20	5	1,368
Commercial	387	148	66	33	36	58	7	-	735
Residential	252	173	64	4	14	4	6	-	517
Recreational	141	167	17	29	3	8	-	-	365
Community	17	12	8	2	1	5	1	1	47
Institutional	297	105	66	19	11	19	9	-	526
Quarrying	2	23	-	-	3	9	3	2	42
Transportation	9	57	8	11	1	11	1	1	99
Communication sites	7	8	3	1	-	5	-	-	24
Miscellaneous	93	107	47	45	15	79	25	30	441
Sub-totals	2,226	1,473	385	239	138	389	72	39	4,961
TOTALS	3,435	3,702	4,381	2,406	4,514	2,781	2,445	3,281	26,945

Note:

Reserves, easements, rights-of-way and linear licenses for utilities are included in the program to which they relate by end-use.

Table J-4: Crown land (upland and aquatic) dispositions (reserves included) in 1987-88, by lands region

Region	Dispositions		
	Aquatic	Upland	Total
	number		
Vancouver Island	419	212	631
Lower Mainland	179	152	331
Thompson-Okanagan	73	292	365
Kootenay	31	311	342
Cariboo	43	348	391
Skeena	52	302	354
Omineca	5	231	236
Peace	-	835	835
TOTALS	802	2,683	3,485

Table J-5: Crown land (upland and aquatic) administrative transactions (reserves included) in 1987-88, by lands region

Region	Transactions		
	Aquatic	Upland	Total
	number		
Vancouver Island	806	437	1,243
Lower Mainland	408	591	999
Thompson-Okanagan	114	1,382	1,496
Kootenay	75	858	933
Cariboo	42	1,531	1,573
Skeena	126	881	1,007
Omineca	16	943	959
Peace	9	1,094	1,103
TOTALS	1,596	7,717	9,313

Table J-6: Number of *Land Act* reserves as of March 31, 1988, as a percentage of total lands tenure portfolio, by lands regions

Region	Tenures	Reserves	Percentage
	number		
Vancouver Island	2,717	718	21
Lower Mainland	2,794	908	25
Thompson-Okanagan	3,177	1,204	28
Kootenay	1,229	1,177	49
Cariboo	3,152	1,362	30
Skeena	1,592	1,189	43
Omineca	1,779	666	27
Peace	2,509	772	24
TOTALS	18,949	7,996	

Table J-7: Number of *Land Act* reserves as of March 31, 1988, by purpose

Purpose	Number of reserves
Land use programs	3,613
Recreation	2,562
Fish/wildlife	275
Forest management	350
Market development	295
Ecology/research	346
Watershed	197
Other	358
TOTAL	7,996

Table J-8: Revenue-producing Crown grants issued in 1987-88

Crown grants	Number	Hectares
Land conveyancing	415	10 180
Home mortgage	29	-
Raised title	10	108
Exchanges	6	291
TOTALS	460	10 579

Table J-9: Free Crown grants issued in 1987-88

	Crown Grants	Area	Value
	Number	hectares	$ '000
Municipalities and regional districts	58	634	$9,602.0
Railway companies	30	1 457	1,647.3
Schools	4	10	115.0
Provincial Crown corporations	4	333	19,494.6
Miscellaneous	3	3	290.8
TOTALS	99	2 437	$31,149.7

Table K-1: Fire suppression program expenditures in 1987-88, by forest region[1]

Region	Direct fire fighting	Suppression flying	Fire equipment	Standby and overtime	Suppression and safety training	Site rehabilitation	Totals
Cariboo	$3,810	$2,171	$-	$-	$10	$6	$5,997
Kamloops	7,453	3,439	49	6	6	21	10,974
Nelson	3,309	2,091	1	110	14	2	5,527
Prince George	7,787	4,002	6	28	18	-	11,841
Prince Rupert	1,696	1,124	-	24	20	-	2,864
Vancouver	3,709	3,122	-	73	10	-	6,914
Victoria	4,247	9,776	5,232	5,641	139	-	25,035
TOTALS	$32,011	$25,725	$5,288	$5,882	$217	$29	$69,152

Note:
1. Excludes $0.456 million in employee benefits, which were also excluded from last year's annual reports.

Table L-1: Canada-B.C. Forest Resource Development Agreement expenditures in 1987-88, by forest region [1]

Regions	Program 1 Backlog reforestation	Program 2 Intensive forest management	Program 3 Implementation and communication	Totals
		$ '000		
Cariboo	$3,123	$2,797	$344	$6,264
Kamloops	2,359	2,579	357	5,295
Nelson	5,143	2,372	409	7,924
Prince George	10,178	3,115	678	13,971
Prince Rupert	3,104	3,258	429	6,791
Vancouver	1,177	5,953	485	7,615
Victoria	16,747	630	777	18,154
TOTALS	$41,831	$20,704	$3,479	$66,014

Notes:
1. Excludes $.053 million in employee benefits, which were also excluded from previous annual reports.

Table L-2: Canada-B.C. Forest Resource Development Agreement accomplishments in 1987-88, by forest region

Program	Sub-program	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Totals
		hectares						
Program[1] Backlog reforestation	Surveys	56 261	25 257	26 190	60 799	20 623	14 085	203 215
	Site rehabilitation	2 647	1 301	3 552	15 533	4 046	864	27 943
	Planting	3 580	3 259	7 255	11 040	2 956	1 023	29 113
	Seedlings planted[1]	4,356	4,144	8,070	14,059	2,931	1,063	34,623
	Sub-totals	62 488	29 817	36 997	87 372	27 625	15 972	260 271
Program[2] Intensive forest management	Brushing	118	959	329	2 457	1 576	1 416	6 855
	Conifer release	248	136	45	472	22	331	1 254
	Spacing[2]	4 551	2 017	1 838	2 411	4 122	3 878	18 817
	Spacing on TFLs[2]	92	310	230	168	117	1 409	2 326
	Fertilization	1 443	1 127	1 838	2 485	1 652	5 152	13 697
	Other	181	103	257	99	-	3	643
	Sub-totals	6 633	4 652	4 537	8 092	7 489	12 189	43 592
TOTALS		69 121	34 469	41 534	95 464	35 114	28 161	303 863

Notes:
1. Number of seedlings planted in thousands. Total = 34,623,000.
2. Includes juvenile spacing and sanitation spacing.

The Ministry's Structure

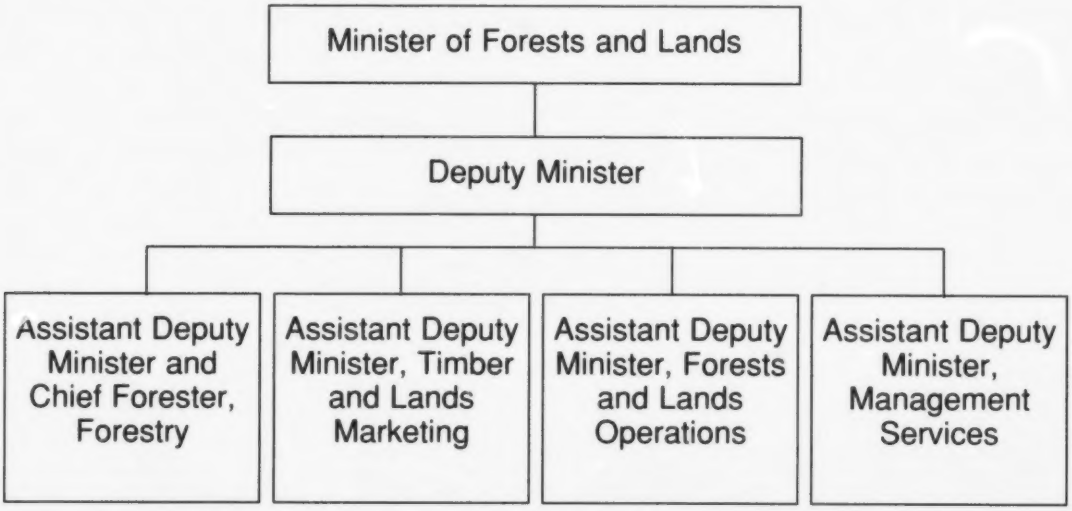
The ministry is structured to:

- Manage the resources more effectively;
- Decentralize decision-making to ensure efficient and highly responsive service to ministry clients;
- Emphasize integrated resource management and forest product development and marketing;
- Establish clear line/staff relationships;
- Ensure accountability of managers;
- Achieve excellence through a commitment to employees; and,
- Emphasize contracting of services and an audit approach to management.

Headquarters Operation

The headquarters staff has four divisions:
- Forestry;
- Timber and Land Marketing;
- Forests and Lands Operations; and
- Management Services.

As shown in the organization chart below, each division is headed by an assistant deputy minister. These four officials, together with the deputy minister as chairman, constitute the ministry's executive.


Minister of Forests and Lands
Deputy Minister
Assistant Deputy Minister and Chief Forester, Forestry
Assistant Deputy Minister, Timber and Lands Marketing
Assistant Deputy Minister, Forests and Lands Operations
Assistant Deputy Minister, Management Services

The Forestry Division ensures that all Crown forest lands are managed to provide the greatest long-term benefits for British Columbians.

The assistant deputy minister of this division is also chief forester.

The Forestry Division is comprised of the following branches.
- Integrated Resources Branch with three sections — Planning; Recreation; and, Range;
- Inventory Branch;
- Research Branch;
- Silviculture Branch; and
- Protection Branch.

Each branch is headed by a director. The director of the Integrated Resources Branch is also the assistant chief forester.

The Timber and Land Marketing Division has two sub-divisions: Timber Marketing and Lands.

The Lands sub-division is headed by an executive director.

Timber Marketing is comprised of two branches, each headed by a director:
- Timber Harvesting Branch with three sections -- Valuation; Timber Allocation; and, Engineering — and,
- Industry Development and Marketing Branch with two sections — Economics and Program Analysis; and Marketing and Trade.

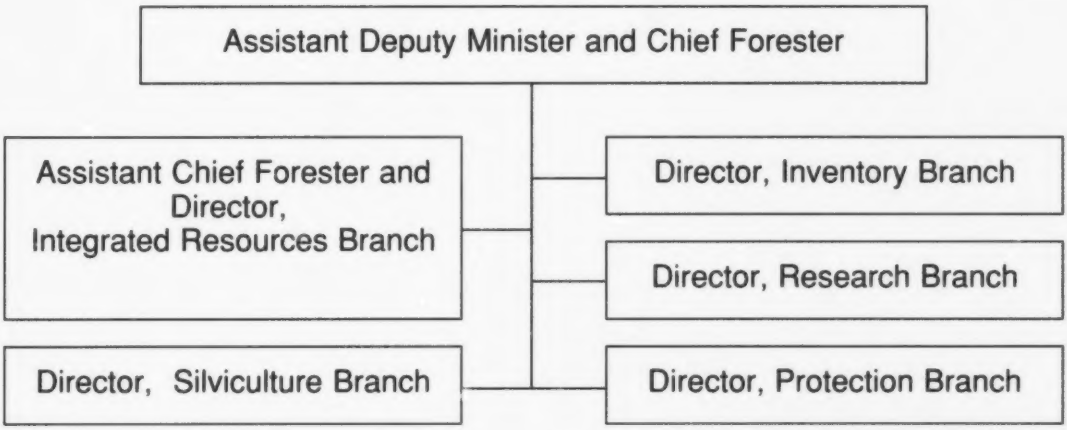
Lands has three branches:
- Land Policy Branch;
- Surveyor General Branch; and
- Real Estate Services Branch.

The Forests and Lands Operations Division has two sub-divisions: Forests and Lands, each headed by an executive director.

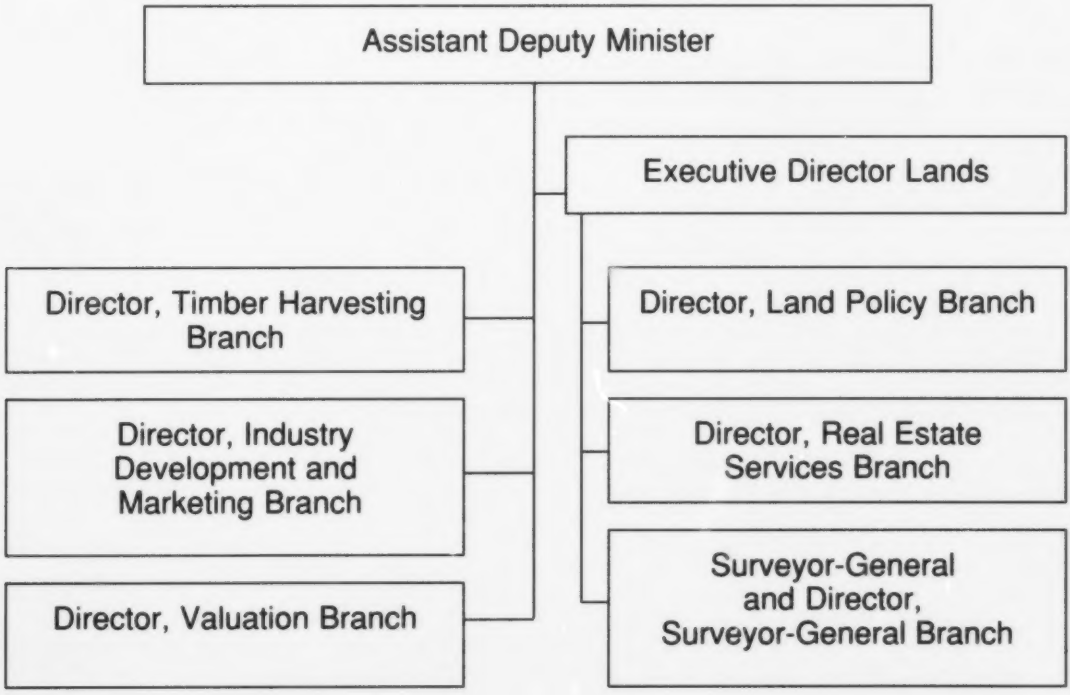
The Forests Division oversees the forests regional and district offices while the Lands Division has the lands regional offices under it.

The Management Services Division is comprised of six branches, each headed by a director:
- Financial Services Branch;
- Information Systems Branch;
- Human Resources Branch;
- Technical and Administrative Services Branch;
- Audit Services Branch; and,
- Public Affairs Branch.

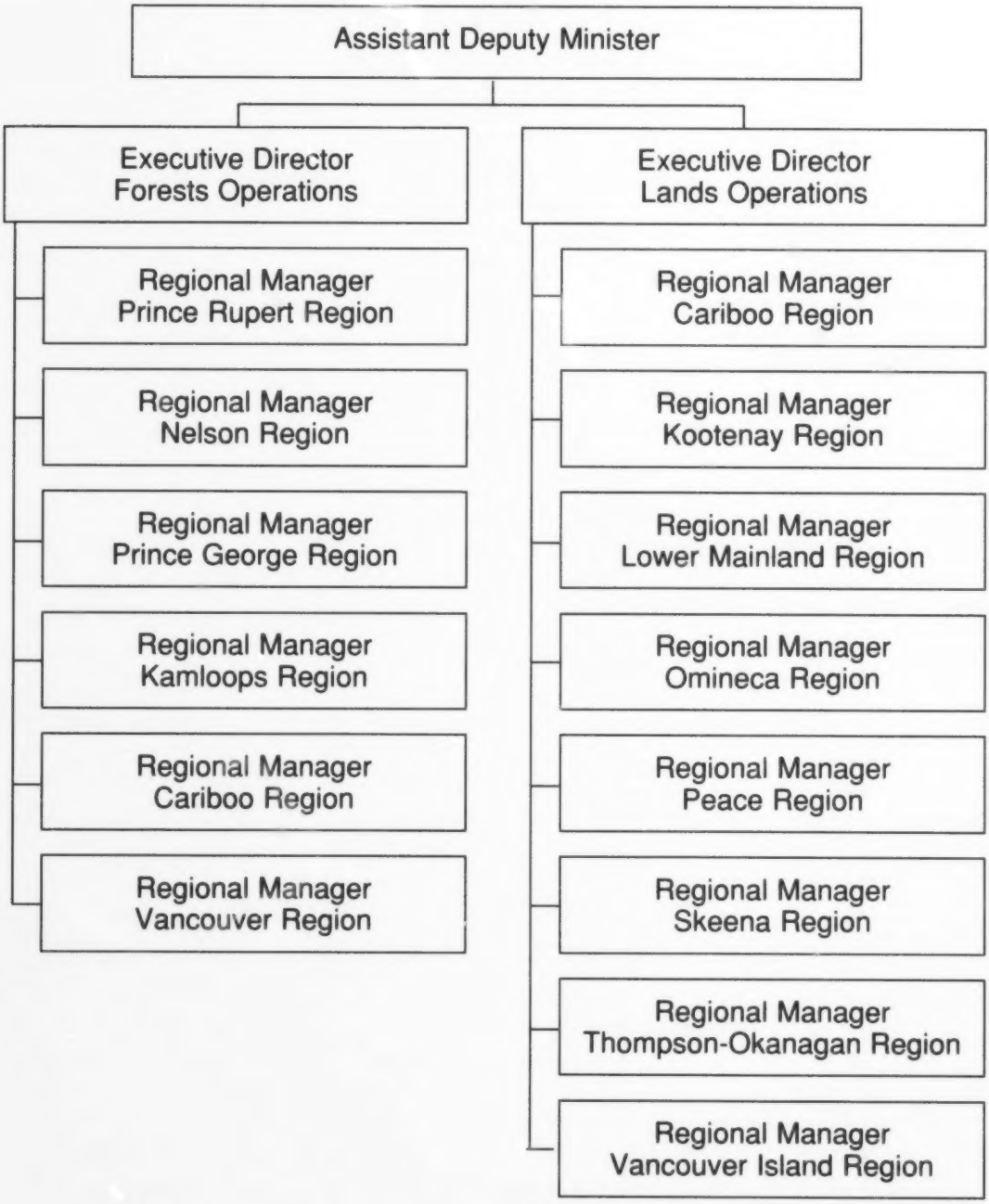
Forestry Division


Assistant Deputy Minister and Chief Forester
Assistant Chief Forester and Director, Integrated Resources Branch
Director, Silviculture Branch
Director, Inventory Branch
Director, Research Branch
Director, Protection Branch

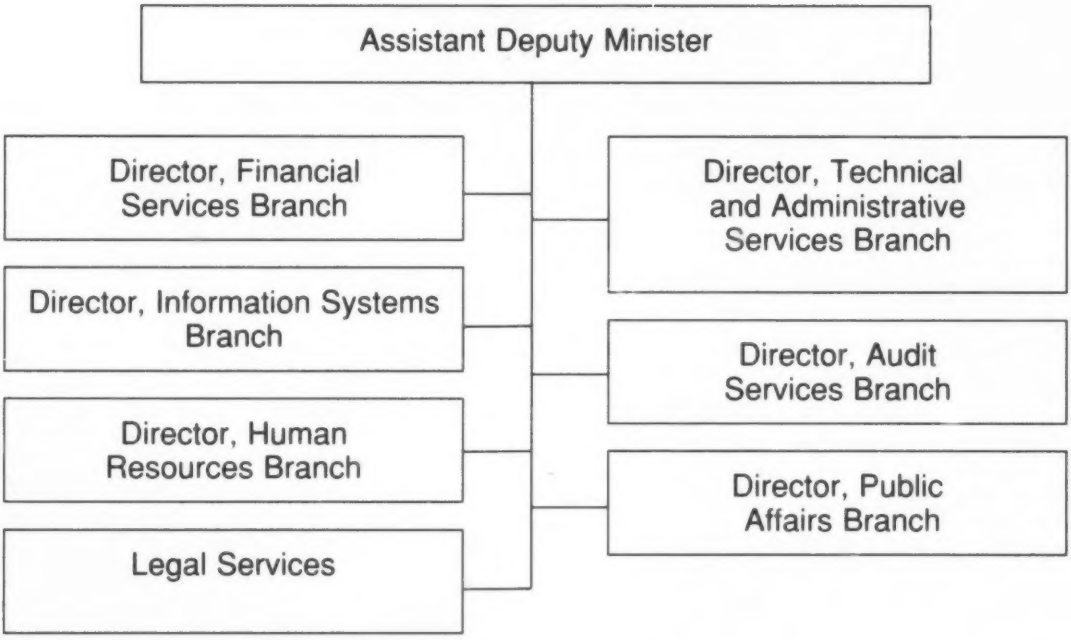
Timber and Land Marketing Division


Assistant Deputy Minister
Executive Director Lands
Director, Timber Harvesting Branch
Director, Industry Development and Marketing Branch
Director, Valuation Branch
Director, Land Policy Branch
Director, Real Estate Services Branch
Surveyor-General and Director, Surveyor-General Branch

Forests and Lands Operations Division



Management Services Division



Region Organization

The province is divided into six forest regions and eight lands regions for administrative purposes. Each has a regional manager.

The forest regions are subdivided into forest districts.

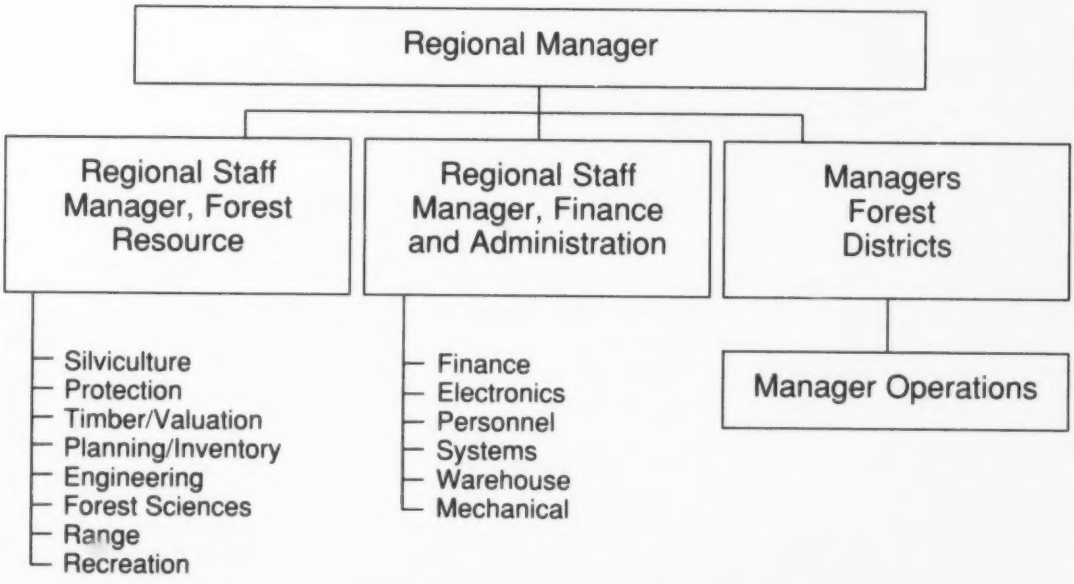
The organization of the forest regional offices is shown below.

Three regional staff managers — for forest resources, finance and administration, and operations provide advice and services to each regional manager and to the various district managers who report to the regional manager.

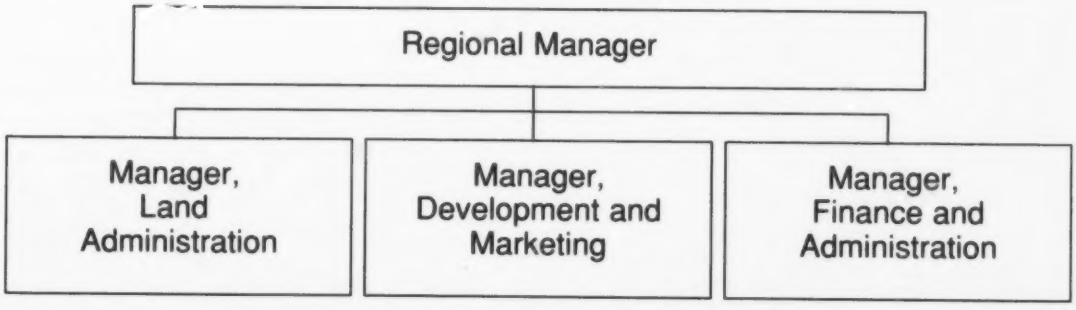
Regional office personnel are responsible for servicing, co-ordinating and monitoring the activities of all field personnel operating out of district offices.

The staff of each regional office develops regional programs and plans, and ensures that all policies, programs and procedures originating from ministry headquarters are administered consistently and effectively throughout the region.

Forests Regional Office



Lands Regional Office



District Organization

The province is divided into 46 forest districts, each administered from its own district office by a district manager.

Some districts also administer field offices.

The organization of the forest district office is shown below.

Three district staff managers — for harvesting, forestry and finance and administration — provide advice and services to each forest district manager.

Forests Regional Office